Chapter 10
Recreational Resources and Aesthetics

10.1 Introduction

This chapter describes the environmental setting for recreational resources and aesthetics (e.g., visual character and quality), and the regulatory background associated with recreational resources and aesthetics. This chapter also evaluates environmental impacts on recreational resources and aesthetics that could result from the Lower San Joaquin River (LSJR) alternatives and, if applicable, offers mitigation measures that would reduce significant impacts.

Recreationists enjoy a variety of water-dependent and water-enhanced activities in the plan area. As described in Chapter 1, *Introduction*, the plan area generally includes those portions of the San Joaquin River (SJR) Basin that drain to, divert water from, or otherwise support beneficial uses of water associated with, the three eastside tributaries[1] of the LSJR. This area includes the Stanislaus, Tuolumne, and Merced Rivers; the rim dams[2] and major reservoirs on each river; the LSJR; and southern Delta waterways.

The extended plan area, also described in Chapter 1, generally includes the area upstream of the rim dams. The area of potential effects for this area is similar to that of the plan area and includes the zone of fluctuation around the numerous reservoirs that store water on the Stanislaus and Tuolumne Rivers. (The Merced River does not have substantial upstream reservoirs.) It also includes the upper reaches of the Stanislaus, Tuolumne, and Merced Rivers. Unless otherwise noted, all discussion in this chapter refers to the plan area. Where appropriate, the extended plan area is specifically identified.

In Appendix B, *State Water Board's Environmental Checklist*, the State Water Resources Control Board (State Water Board) determined whether the plan amendments[3] would cause any adverse impact on resources in each of the listed environmental categories and provided a brief explanation for its determination. Impacts in the checklist that are identified as "Potentially Significant Impacts" are discussed in detail in this chapter. In Appendix B, the State Water Board determined that the impacts of the LSJR alternatives on recreational resources, as listed in the checklist, are either "Less than Significant" or "No Impact." However, as discussed in Appendix B, the State Water Board determined that other types of potential adverse impacts on recreational resources that are not in the checklist should be evaluated. Accordingly, this chapter evaluates impacts not explicitly identified in the checklist but that have been identified in Appendix B as potentially significant. This chapter evaluates whether the LSJR alternatives would substantially physically deteriorate existing recreation facilities on the rivers or at reservoirs. Appendix B also identified the LSJR alternatives as having a potentially significant impact on aesthetics because of the potential to substantially degrade the existing visual character or quality at reservoirs and its surroundings.

[1] In this document, the term *three eastside tributaries* refers to the Stanislaus, Tuolumne, and Merced Rivers.

[2] In this document, the term *rim dams* is used when referencing the three major dams and reservoirs on each of the eastside tributaries: New Melones Dam and Reservoir on the Stanislaus River; New Don Pedro Dam and Reservoir on the Tuolumne River; and New Exchequer Dam and Lake McClure on the Merced River.

[3] These plan amendments are the *project* as defined in State CEQA Guidelines, Section 15378.

The impact analysis in this chapter focuses on changes in surface water elevations that could degrade the existing visual character or quality of the reservoirs. In addition, this chapter addresses whether a substantial adverse effect on scenic vistas or substantial damage to scenic resources within a state scenic highway in the extended plan area would occur.

Recreational and aesthetic impacts in this chapter for the plan area are generally evaluated using the change in the frequency of acceptable average recreation seasonal flow and reservoir elevation level conditions between May and September. For rivers, changes in the volume flow are used to evaluate whether recreational facilities would substantially deteriorate and in-river activities would be significantly reduced. For reservoirs, reservoir elevation levels are evaluated by identifying changes during drier years to present a conservative analysis of the potential recreational and aesthetic impacts that could occur under the LSJR alternatives. This is done by evaluating changes in modeled results at the 30 percent cumulative distribution, representing the lowest one-third of reservoir elevation levels, which represents low elevation conditions typically experienced under drought or dry conditions. For the extended plan area, recreational and aesthetic impacts are generally addressed qualitatively by addressing potential changes to existing resources under the LSJR alternatives, particularly during drought periods.

As discussed in Appendix B, the southern Delta water quality (SDWQ) alternatives are not anticipated to adversely affect recreational resources or aesthetics in the southern Delta because water quality in the southern Delta is expected to remain within historical ranges (see Chapter 5, *Surface Hydrology and Water Quality*). Furthermore, any changes in salinity levels within historical ranges are expected to be imperceptible to recreationists. Therefore, the effects of the SDWQ alternatives are not analyzed further in this chapter. To comply with specific water quality objectives or the program of implementation under SDWQ Alternatives 2 or 3, construction and operation of different facilities in the southern Delta could occur, which could involve impacts on recreational resources or aesthetics. These impacts are evaluated in Chapter 16, *Evaluation of Other Indirect and Additional Actions.*

The potential impacts of the LSJR alternatives on recreational resources and aesthetics are summarized in Table 10-1. As described in Chapter 3, *Alternatives Description*, LSJR Alternatives 2, 3 and 4 each include four methods of adaptive implementation. This recirculated substitute environmental document (SED) provides an analysis with and without adaptive implementation because the frequency, duration, and extent to which each adaptive implementation method would be used, if at all, within a year or between years under each LSJR alternative is unknown. The analysis, therefore, discloses the full range of impacts that could occur under an LSJR alternative, from no adaptive implementation to full adaptive implementation. As such, Table 10-1 summarizes impact determinations with and without adaptive implementation.

Impacts related to the No Project Alternative (LSJR/SDWQ Alternative 1) are presented in Chapter 15, *No Project Alternative (LSJR Alternative 1 and SDWQ Alternative 1)*, and the supporting technical analysis is presented in Appendix D, *Evaluation of the No Project Alternative (LSJR Alternative 1 and SDWQ Alternative 1).* Chapter 16, *Evaluation of Other Indirect and Additional Actions,* includes discussion of impacts related to actions and methods of compliance.

Table 10-1. Summary of Recreational Resources and Aesthetics Impact Determinations

Alternative	Summary of Impact(s)	Impact Determination without Adaptive Implementation	Impact Determination with Adaptive Implementation[a]
Impact REC-1: Substantially physically deteriorate existing recreational facilities on the rivers or at the reservoirs			
No Project Alternative (LSJR/SDWQ Alternative 1)	See note.[b]	Significant	NA
LSJR Alternative 2	Under LSJR Alternative 2, modeled flows are not expected to cause substantial physical deterioration of on-bank recreational facilities because the seasonal average frequency of river flows (cubic feet per second [cfs]) would not change substantially from baseline. Modeled flows would also not affect in-water recreational activities because they would not change significantly from baseline. Under LSJR Alternative 2, there would be relatively small changes in reservoir elevations. These changes would not substantially deteriorate existing recreational facilities at the reservoirs because all boat ramps and other facilities would remain available to recreationists.	Less than significant	Less than significant
LSJR Alternative 3	Modeled frequencies of flows greater than 2,500 cfs would change little on the Merced and Stanislaus Rivers, and therefore on-bank recreational facilities would not experience substantially more inundation relative to baseline conditions. However, flows greater than 2,500 cfs would increase in frequency on the Tuolumne River in May and June, but would remain close to baseline values July – September. Although the flows on the Tuolumne River could result in an increase in the frequency of inundation of on-bank recreation areas during May and June, recreational facilities are not anticipated to substantially physically deteriorate along the river. On-bank recreational facilities are built to withstand periodic inundation with higher river flows. The modeled seasonal average frequency of low flows (less than 500 cfs) on the Merced and Tuolumne Rivers would decrease more than 10% relative to baseline conditions. However, during July-September, the most popular recreational months for the three eastside tributaries, the frequency of low flows would change by less than 10% relative to	Less than significant	Significant and unavoidable[c]

Alternative	Summary of Impact(s)	Impact Determination without Adaptive Implementation	Impact Determination with Adaptive Implementation[a]
	baseline for the three eastside tributaries. Therefore, this alternative is not anticipated to affect in-water activities, with or without adaptive implementation. The change in reservoir elevations under LSJR Alternative 3 would not significantly affect recreation at New Melones Reservoir or Lake McClure. It is expected that there would be a substantial decrease in elevation of New Don Pedro Reservoir. However, because all boat ramps in New Don Pedro Reservoir would remain operable at the 30% cumulative distribution elevation (e.g., dry years), and because some boat ramps in New Don Pedro Reservoir are still operable at minimum reservoir elevations, there would be no physical deterioration nor reduction in the use of existing recreation facilities at this location. If adaptive implementation method 1 were implemented on a long-term basis (an increase in the February–June percent of unimpaired flow from 40% up to 50%), it is expected that the modeled seasonal average frequency of river flows above 2,500 cfs on the Tuolumne River would greatly increase, especially during May and June. The frequency of inundation of on-bank facilities on the Tuolumne River and, to a lesser extent, on the Stanislaus River is expected to increase compared to baseline. Accordingly, LSJR Alternative 3, with the incorporation of adaptive implementation method 1, would cause substantial~~ly~~ deterioration of existing recreational facilities.		
LSJR Alternative 4	There would be a substantial increase in flows above 2,500 cfs on the Tuolumne and Stanislaus Rivers under LSJR Alternative 4, with or without adaptive implementation. Although on-bank recreational facilities are built to withstand periodic inundation, facilities may substantially physically deteriorate from the expected significant increase in inundation frequency relative to baseline. The modeled seasonal average frequency of low flows on the Merced and Tuolumne Rivers, without adaptive implementation, would decrease more than 10%. The decrease is mostly due to low flow reduction in May and June. However, because there would be little	Significant and unavoidable	Significant and unavoidable

Alternative	Summary of Impact(s)	Impact Determination without Adaptive Implementation	Impact Determination with Adaptive Implementation[a]
	change in low flows on the Stanislaus, Tuolumne, and Merced Rivers relative to baseline during the warmest months in the San Joaquin Valley when swimming and wading are most popular (July–August), the reduced opportunity for swimming and wading on the three eastside tributaries in May, and particularly in June (i.e., early in the summer recreational season), is not expected to substantially reduce recreational use for the season. Seasonal average elevations at Lake McClure and New Melones Reservoir are expected to increase. The seasonal average elevation at New Don Pedro Reservoir is expected to decrease at the 30% cumulative distribution elevation. Decreased reservoir levels at New Don Pedro Reservoir would not substantially physically deteriorate existing recreation facilities at the reservoirs (marinas and boat ramps), and all boat ramps would remain operable. There would be no reduction in use of the facilities at New Don Pedro Reservoir. Therefore, given the significant increase in the modeled frequency of high seasonal average flows (greater than 2,500 cfs) on the Stanislaus and Tuolumne Rivers associated with LSJR Alternative 4, with and without adaptive implementation, substantial physical deterioration of existing recreational facilities is expected.		
Impact REC-2: Substantially degrade the existing visual character or quality of the reservoirs			
No Project Alternative (LSJR/SDWQ Alternative 1)	See note.[b]	Significant	NA
LSJR Alternative 2	Under certain conditions, reservoir elevations at Lake McClure and New Melones Reservoir could increase and could result in an improvement to the existing views. The expected decrease in reservoir elevation at New Don Pedro Reservoir would not result in a substantial degradation of existing visual character or quality.	Less than significant	Less than significant
LSJR Alternatives 3 and 4	Under certain conditions, reservoir elevations would increase at Lake McClure and New Melones Reservoir and could improve the existing views.	Less than significant	Less than significant

Alternative	Summary of Impact(s)	Impact Determination without Adaptive Implementation	Impact Determination with Adaptive Implementation[a]
	At New Don Pedro Reservoir, decreases in water surface elevation during some dry years could cause a substantial degradation of existing visual character or quality; however, views at this location are Class III, and changes to the character of the landscape can be moderate without compromising visual quality.		

[a] Four adaptive implementation methods could occur under the LSJR alternatives, as described in Chapter 3, *Alternatives Description*, and summarized in Section 10.4.2, *Methods and Approach,* of this chapter.

[b] The No Project Alternative (LSJR/SDWQ Alternative 1) would result in the continued implementation of flow objectives and salinity objectives identified in the 2006 *Water Quality Control Plan for the San Francisco Bay/Sacramento-San Joaquin Delta Estuary* (2006 Bay-Delta Plan). See Chapter 15, *No Project Alternative (LSJR Alternative 1 and SDWQ Alternative 1),* for the No Project Alternative impact discussion and Appendix D, *Evaluation of the No Project Alternative (LSJR Alternative 1 and SDWQ Alternative 1),* for the No Project Alternative technical analysis.

[c] Implementing adaptive implementation method 1, on a more frequent basis can result in a change in the impact determination for LSJR Alternative 3, as summarized in this table, and described in detail in Section 10.4.3*, Impacts and Mitigation Measures*, of this chapter.

10.2 Environmental Setting

There are three distinct environments for water-based recreation on the Stanislaus, Tuolumne, and Merced Rivers, the LSJR, and the southern Delta: flowing rivers, controlled reservoirs, and open (i.e., tidal) Delta waterways. Recreation takes place in managed facilities, at informal access points, and in undeveloped areas. Much of the recreation use is water dependent (e.g., boating, swimming), but many other popular activities (e.g., camping, hiking) are simply enhanced by the presence of water. Recreational opportunities have been substantially influenced by the construction of reservoirs and the management of the water levels in those reservoirs and the resulting effect on river flows.

Typical recreational activities in the watersheds include: boating, fishing, swimming, water sports, horseback riding, hiking, biking, camping, picnicking, birding and nature viewing, hunting, and gold panning. Facilities constructed throughout the plan area permit similar recreational uses (e.g., boat-based fishing, kayaking, beach swimming, picnicking), although the spectrum of uses may shift depending on conditions. Swimming is more common in the reservoirs but may also occur on the rivers during low flows. Boating activities, such as whitewater rafting, kayaking, and canoeing, are popular on the rivers. Preferred recreational activities change with time, reflecting the current economic and cultural conditions. For example, undeveloped areas in the plan area, such as wildlife preserves, were once widely used for hunting, but are now becoming increasingly popular for other uses, such as nature viewing and bird watching (USBR 1999).

The existing recreational uses of the LSJR, its three eastside tributaries, the reservoirs at the rim dams, and the southern Delta are described below.

10.2.1 Rivers

Flows in the LSJR and eastside tributaries are regulated by the rim dams. Different ranges of flow releases from storage[4] support different recreational uses and facilities along the rivers. These flows also contribute to the aesthetic characteristic of the landscape in which they are located. The LSJR and eastside tributaries are generally characterized by a river channel flanked with a narrow ribbon of riparian vegetation, complemented in some areas by larger wildlife preserves and parks, and interrupted by agricultural development and urbanization. The viewsheds are variable, but unified by the natural aspect of the rivers and the interface with either the natural or augmented landside. Due to the variability of rivers and the dynamic shoreline, viewers are generally less sensitive to changes in river height, and are affected primarily by severely high or low flows. Details regarding the different recreational uses of the Stanislaus, Tuolumne, and Merced Rivers and the LSJR are discussed below.

Merced River

The lower reach of the Merced River, from below McSwain Dam to the river's confluence with the LSJR, is 50 miles long and crosses private agricultural and grazing land in Merced County. This reach of the Merced River includes contact water recreation (e.g., swimming, wading, water skiing, and fishing) and non-contact water recreation (e.g., hiking, picnicking, and boating) as designated beneficial uses (State Water Board 1998).

Major public recreation facilities on this river reach include Henderson County Park on Merced Falls Road east of Snelling, McConnell State Recreation Area (SRA) northeast of Livingston on State Route 99, Hagaman County Park at the State Route 165 river crossing, and George J. Hatfield SRA on Kelley Road near the LSJR confluence. The county parks are primarily day-use facilities, while the SRAs provide both day-use and camping areas (USBR 1999). The county parks do not have boat launch ramps, and they do not allow swimming because lifeguards are not present. Approximately 73,000 water-related visitor days are spent on the Merced River annually (USBR 1999). The Merced River is largely surrounded by private land, which limits the opportunities for public access (Merced ID 2011a).

Water-dependent activities include some canoeing and rafting in the lower portion of the river. Water-enhanced activities include picnicking, and camping (USBR 1999). Boat-based fishing is popular between the Merced Falls Dam and the Crocker–Hoffman Diversion Dam, especially during high flows. Generally, flows below 500 cubic feet per second (cfs) are considered too low for boating. Flows are currently below 500 cfs approximately 83 percent of the time in the summer months. Popular sport fish that are found in this stretch of the Merced River include catfish and smallmouth bass (USBR 1999).

Kayaking, rafting, and canoeing take place on the lower Merced River at flows of 250–3,200 cfs. In a study conducted in the winter of 2010, the boaters surveyed indicated that while the river's reach was floatable at the winter low flow levels down to 250 cfs, they would not likely return to boat the

[4] In this document, the term *releases from storage* means water is released from the reservoir.

Merced River because the flow did not provide a quality boating opportunity at that flow level (Merced ID 2011b). Overall, the boaters surveyed in the study identified a boatable flow range for canoes and kayaks of roughly 570 to 2,000 cfs (Merced ID 2011b). For kayakers and rafters, flows of approximately 300–350 cfs are considered appropriate for beginners, while high flows of 1,200-3,200 cfs are considered advanced (American Whitewater 2012).

During lower flows in the fall and winter, wading is more popular (Merced ID 2011b). Optimal flow ranges on the Merced River for swimming are 50–200 cfs (USBR 2001).

Tuolumne River

The lower Tuolumne River, from New Don Pedro Dam to the river's confluence with the LSJR, is approximately 52 miles long. This reach of the Tuolumne River includes contact and non-contact water recreation as designated beneficial uses (State Water Board 1998). This reach traverses mainly private open space and grazing lands, City of Modesto property, and several public parks; therefore, access to the river is limited.

Existing recreation facilities include: La Grange County Regional Park, Fox Grove County Regional Park, Riverdale, two golf courses adjacent to the river near the State Route 99 crossing, and the Shiloh fishing access. In addition, the Turlock SRA and Modesto Reservoir Regional Park provide camping facilities. There is also public access to the river at the Tuolumne River Regional Park near Modesto (San Joaquin River Partnership 2012).

Common water-dependent recreational activities on the Tuolumne River include boating, fishing, swimming, and rafting. Together with wildlife viewing, 150,000 visitor days were spent conducting these water-dependent recreational activities in 1992 (USBR 1999). Rafting season is generally April–October. The optimal flow for rafting is 300 cfs (TID and Merced ID 2011). Boating season on the lower Tuolumne River is typically May–October. The lowest boatable flow on the upper reaches of the lower Tuolumne River ranges from 100–150 cfs (TID and MID 2013a). Drift boaters and rafters identified the lower Tuolumne as unboatable at 150 cfs. Recent daily average flow data collected at the La Grange gage indicated flows were at or above 150 cfs approximately 84 percent of the time, and during the boating season flows were at or above 150 cfs 98 percent of the time in May and 56 percent of the time July–September (TID and MID 2013a).

Stanislaus River

The lower Stanislaus River runs 60 miles from the New Melones Dam to the river's confluence with the LSJR, crossing primarily private agricultural and grazing lands in Tuolumne, Stanislaus, and San Joaquin Counties (see Chapter 11, *Agricultural Resources*). This reach of the Stanislaus River includes contact and non-contact water recreation as designated beneficial uses (State Water Board 1998).

The Stanislaus River has numerous park facilities, many used for water-dependent activities, such as boat launching, fishing, camping, swimming, as well as water-enhanced activities, such as picnicking or camping. Parks include Knights Ferry Recreation Area, Horseshoe Park, Orange Blossom Park, Valley Oak Recreation Area, Oakdale Recreation Area, Jacob Meyers Park, McHenry Recreation Area, and Caswell Memorial State Park. There is also public access to the river at numerous road crossings. In 1999, there were an estimated 330,217 recreational visitor days spent on the Stanislaus River (McAfee 2000).

Water-dependent activities practiced on the Stanislaus River include fishing, swimming, and whitewater boating (rafting and kayaking). Popular sport fish found in this stretch of the Stanislaus River include catfish, crappie, largemouth bass, and smallmouth bass. Boating activities on the Stanislaus River generally take place when the flow is 25–1,200 cfs (Dreamflows 2011). Flows of 500 cfs–3,000 cfs can allow for advanced rafting and kayaking (All Outdoors 2011). Access to an advanced, 4-mile whitewater boating run is provided below Goodwin Dam (USBR 1999). Extensive boating use on the lower Stanislaus River has contributed to eroding beaches, excessive noise, trespassing, and other issues that degrade recreating visitor experiences (McAfee 2000).

Lower San Joaquin River

Public access to the LSJR is available at several road and highway crossings. Stanislaus County recreation facilities on the LSJR include the Las Palmas fishing access site and Laird County Park (USBR 2001). In addition, there is ~~Durham Ferry SRA in San Joaquin County,~~ and the San Joaquin National Wildlife Refuge between the Stanislaus and Tuolumne River confluences (San Joaquin River Partnership 2012). Most of the use of these recreational areas is assumed to come from the local counties (USBR 1999).

The LSJR includes contact and non-contact water recreation as designated beneficial uses (State Water Board 1998). An estimated 157,000 visitor days are spent boating and fishing in the LSJR annually (USBR 2001). Popular sport fish that occur in this stretch of the SJR include catfish and smallmouth bass (USBR 1999). Water-enhanced shore activities include picnicking and other activities.

The optimal flow range for non-motorized boating activities on the LSJR has been estimated to be 300-500 cfs, while motorized boating may occur at flows up to 750 cfs (USBR 1997; Frago pers. comm.). However, characterizing the optimal flows for recreation on the LSJR is much more complex than for the three eastside tributaries. This is due to the river's variability in flow within the plan area; flow increases at each river confluence. South of the Merced River confluence, the river has been nearly dry at times in recent years, while summer flows in the SJR at Vernalis range between about 1,000 cfs in dry years to more than 10,000 cfs in wet years. The monthly median flows at Vernalis range between 5,000 cfs in the spring (May) and 2,000 cfs in the late summer (August and September).

10.2.2 Reservoirs

Peak visitation of California reservoirs is generally in the drier months of May through August. Recreational opportunities on and near the reservoirs are influenced by water levels; therefore, the manner in which a reservoir is operated directly affects visitor use and the quality of the recreational experience. Reservoir operations for water supply are usually adequate to support established recreation activities and facilities, particularly when surface runoff from precipitation is near normal. Recreation facilities, such as beaches, boat ramps, trails, restrooms, access roads, picnic areas, and camping facilities add to the quality of the recreation experience. Lower reservoir levels, however, result in water surface receding far from developed recreation facilities, such as campgrounds, picnic areas, and swimming beaches. Boat ramps, docks, and swimming areas become unusable if they are no longer submerged or are no longer close to the water. Declining surface area affects boating and water skiing and reduces aesthetic values. Recreation attendance decreases when water levels drop well below major recreation facilities and boat ramps. During the 1976-1977 drought, total attendance at state and federal reservoirs in California decreased approximately 30 percent, with some reservoirs experiencing declines of as much as 80 percent. Attendance at a few stable reservoirs actually increased. A similar pattern developed during the

1987–1992 drought, although there were even fewer stable reservoirs (DWR 1994). Viewers (e.g., recreationists) of the reservoirs experience both a managed aesthetic (e.g., changes in water elevation levels as a result of reservoir operation) and a natural aesthetic (e.g., surrounding forest and mountains). Generally, those participating in recreational activities in and around reservoirs are likely to highly value the natural environment, appreciate the visual experience, and be sensitive to changes in visual character and quality.

Lake McClure

The New Exchequer Dam impounds the Merced River, forming Lake McClure. The reservoir's visual character and quality is that of both a natural environment (e.g., surrounding forest and mountains) and a managed environment (e.g., recreation and hydropower facilities).

Generally, the surrounding area view is of the Sierra Nevada and includes low rolling hills and rugged mountains, with differing trees and vegetation bordering the reservoir. The dominant visual elements are the hills, ridges, small valleys, and patterns created by the vegetation on the hills and the surface of the water. The vegetative patterns are influenced by a combination of soil types, aspect, and fire history. The hills are occasionally accented by steep canyon walls. Native vegetation transitions to nonnative plants and trees in a few residential and more developed areas.

The managed environment in the vicinity of the reservoir presents varying visual contrast when compared to the natural environment that surrounds and extends beyond the reservoir. There are two-lane roads and highways around the reservoir that afford views of the mountains, trees, and reservoir. The Highway 49 Bridge, Lake McClure, and part of Bagby Recreation Area can be seen from the Highway 49 vista point just north of the bridge. The Sierra Nevada foothills are taller and more dramatic in this area than other areas around the reservoir, and the vegetation is similar to other areas around the reservoir. The New Exchequer Dam, support buildings, and spillway present a strong visual contrast relative to the natural landscape due to the geometric shapes and light colors. The New Exchequer Dike presents moderate visual contrast due to the gray tones and rough texture of the rock facing of the structure (Merced ID 2014).The small footprint of the Bagby Boat Launch facility presents a weak visual contrast to the surrounding natural landscape. The road presents strong visual contrast when compared to the natural surroundings due to the shape, texture, and color of the road (Merced ID 2011a).Low water elevations in the reservoir create a strip of bare land around Lake McClure that is sparse in vegetation, creating a strong visual contrast with the natural surroundings (Merced ID 2014).

Residential and recreational structures contrast with the surrounding foothill and mountain scenery. These rural developed areas are within close proximity of the reservoir and include towns and primary road networks; however, the setting is pastoral or rural because of interspersed forests, water resources, hills, and valleys.

The shoreline edges along the reservoir appear natural and include vegetation and land and water interface; however, these edges also exhibit unnatural features, such as human-made facilities (e.g., water control structures and recreation facilities) and large bands of exposed soil. Recreation facilities are prevalent around the shoreline edges of the reservoir, including boat docks, beaches, campgrounds, and marinas, all of which are also considered a contrasting visual quality to the surrounding natural setting of the Sierra Nevada foothills and mountains. There is no vegetation at the shoreline, which is characteristic of the shore/water interface given the daily, monthly, and seasonal fluctuations in water elevation (USBR 2007; USBR 2011a).

Lake McClure recreation facilities include 4 developed areas (McClure Point, Barrett Cove, Horseshoe Bend, and Bagby), with 530 camping units, 5 boat launch facilities, 2 marinas, 62 picnic units, and fish cleaning stations. Day-use facilities include sandy beaches and swim lagoons, most in grassy park-like settings with group facilities and play equipment (DWR 2001). The recreation facilities are owned and operated by Merced Irrigation District's (Merced ID) Parks Department, with the exception of two small areas within McClure Point Recreation Area and Horseshoe Bend Recreation Area that are owned by the U.S. Bureau of Land Management (BLM).

Outside of the four public access areas on Lake McClure, the remainder of the land surrounding the reservoir is private (Merced ID 2011a). Since most of the undeveloped reservoir shoreline is relatively far from roads and the shoreline is irregular and steep, little recreational activity occurs there (DWR 2001). Lake McSwain is a small reservoir located about 3 miles downstream of the New Exchequer Dam. Lake McSwain offers adjacent recreational opportunities.

Recreational activities on Lake McClure and McSwain Reservoir include camping, boating, swimming, hiking, bicycling, houseboating, and fishing. In 2010, nearly 1.4 million visitor days were spent on Lake McClure, and approximately 482,000 visitor days were spent on McSwain Reservoir (Merced ID 2014). Lake McClure is popular with water skiers because the surrounding tree covered hills protect the reservoir from the prevailing westerly winds (DWR 2001). In 2010, an average of 100 watercraft were reported on Lake McClure at one time (0.01 watercraft per acre), 94 percent of which were motorized (Merced ID 2011a). Recent surveys conducted by Merced ID have indicated that most visitors to Lake McClure are local (Merced ID 2011a).

Modeled reservoir elevation has ranged between approximately 865 feet (ft) mean sea level (MSL) and 635 ft MSL. Therefore, reservoir elevations during drought years can be 230 ft below the historical maximum elevation. Historically, the monthly average elevation of the reservoir has ranged from a minimum of 755 ft MSL in October to a maximum of 810 ft MSL in June. Boat access is provided at ramps located around the shoreline. Lake McClure boat ramps cease operation when reservoir elevation is 590–793 ft MSL. The ramp at Bagby is the first to close when the reservoir decreases to an elevation of 793 ft MSL, followed by Horseshoe Bend at 758 ft MSL, McClure Point at 650 ft MSL, southern Barrett Cove at 630 ft MSL, and northern Barrett Cove and Piney Creek, both at 590 ft MSL (USBR 1999). Reservoir visitors report that the current water levels in the reservoir are acceptable but can sometimes cause degraded scenery (Merced ID 2011a).

New Don Pedro Reservoir

The New Don Pedro Dam impounds the Tuolumne River, forming the New Don Pedro Reservoir. Generally, the visual character and quality that recreationists and others experience around the New Don Pedro Reservoir is similar to that described for Lake McClure. Numerous long expanses of flat water that stretch through a series of narrow valleys and inlets characterize New Don Pedro Reservoir's visual setting. Similar to Lake McClure, the Sierra Nevada foothills surround the reservoir, rising gradually from its shoreline to grant wide and open views. There are very few buildings in the vicinity of the reservoir. Views are not urban or suburban in nature. Two-lane roads and highways provide views of the mountains, trees, and water.

The largely tree-covered hillsides are interspersed with grassland areas that remain unvegetated during the dry summer months. As the water level falls, an unvegetated ring around the entire reservoir is clearly visible (~~San Francisco Planning Department~~SFPUC 2007). Where the slopes are steeper, sandy brown soils are exposed. In some locations, the drawdown exposes large rocky areas which tend to match rocky areas above the high water mark and present little visual contrast. As the

reservoir elevation gets lower and the drawdown zone expands, the visual lack of vegetation emphasizes a strong visual contrast between the natural, vegetated hillside and the exposed hillside (TID and MID 2013b). New Don Pedro Reservoir provides 160 miles of shoreline and 13,000 acres of surface area at maximum reservoir level. The reservoir has hiking trails, two marinas, a swimming lagoon, and 559 campsites in three locations (Fleming Meadows Recreation Area, Blue Oaks Recreation Area, and Moccasin Point Recreation Area). Outside of the three developed recreation areas, there is boat-in access to much of the shoreline and to the islands within the reservoir for dispersed use, including day use and primitive camping. The recreation facilities are operated by the Don Pedro Recreation Agency (DPRA), which is a department within Turlock Irrigation District (TID). The Modesto Irrigation District (MID) and the City and County of San Francisco (CCSF) sponsor the DPRA. The primary objective of the DPRA is to provide a quality family camping experience and a water sports-oriented environment (TID and Merced ID 2011).

The maximum reservoir elevation is 830 ft MSL. The monthly average elevation of the reservoir has ranged from a low of 750 ft MSL in October to a high of 790 ft MSL in June. The minimum elevation, recorded during a drought period, was 630 ft MSL. Therefore, the reservoir elevations can vary by approximately 200 ft. Boat launches are available at the Fleming Meadows campsite until the reservoir elevation drops below 600 ft MSL. The boat launches at Moccasin Point and Blue Oaks are usable above 722 ft MSL and 726 ft MSL, respectively. Boating activity on the reservoir declines at reservoir levels of 790–750 ft MSL (USBR 1999).

The maximum recreation capacity of New Don Pedro Reservoir is 500,000 visitor days annually (Barnes 1987). Peak recreation season is typically April–September. In 2012, the total recreation visitor use days during peak season was approximately 244,000. The highest use occurred during July, with nearly 87,000 recreation visitor use days (TID and MID 2013a). During the 2012 off-season (November–March), there were a total of 18,248 visitor use days, with fewer than 6,000 recreation visitor use days each month (TID and MID 2013a).

New Melones Reservoir

The New Melones Dam impounds the Stanislaus River, forming the New Melones Reservoir. New Melones Reservoir is relatively large with a varied geography that promotes many types of recreation. Generally, the visual character and quality of the reservoir is similar to that of Lake McClure and New Don Pedro Reservoir. The visual setting includes views of mountains and pine forest interspersed with grasslands. The shoreline is modified with recreational facilities.

The seasonal reservoir drawdown can result in an area of exposed soil with little or low-growing vegetation around the shoreline. Where the slopes are steeper, reddish brown soils are exposed; and where slopes are gentler, more grasses and low vegetation tend to become established. This view, typically experienced in summer, is exacerbated during periods of low precipitation and drought. The reservoir provides approximately 12,500 acres of surface area at capacity for recreation and supports approximately 800,000 visitor days annually (USBR 2011b). There are six recreation areas on New Melones Reservoir. The Mark Twain, Parrot's Ferry, Camp Nine, and Old Town areas are relatively undeveloped and offer few recreation facilities. The remaining recreation areas, Glory Hole and Tuttletown, offer the most structured visitor experience and are the most visited, with approximately 750,000 annual visitor days (McAfee 2000). The Glory Hole Recreation Area has two campgrounds with a total of 144 campsites, three day-use areas, hiking and biking trails, swim beaches, two boat launch ramps, and a marina with a store. The Tuttletown

Recreation Area has three campgrounds with a total of 161 campsites, two day-use areas, a boat ramp, and a visitor's center. USBR operates all recreation facilities on New Melones Reservoir.

Many recreational activities take place at New Melones Reservoir. Hunting is permitted on all of USBR's lands surrounding the reservoir, with the exception of Tuttletown and Glory Hole, but mostly takes place within or near the Peoria Wildlife Management Area. Bank fishing and gold panning takes place along the shoreline. Hiking, bicycling, and horseback riding are conducted on the approximately 25 miles of trails surrounding the reservoir. There are also several caves near the reservoir, and many visitors are involved in spelunking, or caving, in the handful of caves open to the public. The most frequented caves are the two Natural Bridges located within the Coyote Creek tributary (USBR 2007).

The average elevation of the reservoir has typically ranged from 948 ft (in October) to 973 ft (in March and June).Therefore, average seasonal drawdown is 25 ft. The minimum reservoir elevation was recorded at 712 ft MSL (July–November). The maximum reservoir elevation, typically recorded in June, is 1,085 ft MSL. Minimum reservoir elevations are below the lowest boat launch facilities. With the exception of the boat ramp at Glory Hole, all boat ramps become inoperable at reservoir elevations below 950 ft MSL. The Glory Hole boat ramp is a 2-lane facility that provides boat access at a reservoir elevation as low as 860 ft MSL. The optimal water level for recreational use of the reservoir is 950–980 ft MSL (State Water Board 1999). In the recreation areas used for camping, visitation tends to follow reservoir surface levels, declining when water levels are low. However, other recreational uses of the reservoir, such as boating and kayaking, increase when water levels recede (McAfee 2000). Prior to construction of the New Melones Dam, whitewater rafting was popular in what is now the northern portion of the reservoir near Camp Nine. This area is still rafted and kayaked when reservoir water levels are low and flow returns to the exposed channel, such as in drought years.

Tulloch Reservoir

The Tulloch Reservoir, located less than a mile downstream of the New Melones Dam, provides additional recreational opportunities. The Tulloch Reservoir is owned by the Oakdale Irrigation District (OID) and South San Joaquin Irrigation District (SSJID). Private development is extensive around the perimeter of the reservoir. Public access to the water is provided through two privately owned marinas, South Shore Campground and Marina in Tuolumne County, and Lake Tulloch Resort in Calaveras County. Private residences and private parks operated by housing developments provide additional access to the water (OID and SSJID 2008).

Tulloch Reservoir provides 1,260 acres of surface water for recreation. The surface elevation remains fairly constant, but the reservoir is regularly lowered by approximately 10 ft in the winter to provide space for flood control releases from New Melones Reservoir (OID and SSJID 2008).

10.2.3 Extended Plan Area

In general, views of the rivers in the extended plan area include features of the surrounding landscape, such as hills, mountains, valleys, vegetation, and other natural resources. Urban and suburban features are limited, and typically views of the natural landscape are uninterrupted with buildings or infrastructure. The Stanislaus National Forest comprises a large portion of the extended plan area. The extended plan area covers large parts of Calaveras, Tuolumne, and Mariposa Counties. These counties are primarily rural in nature and are characterized by rolling

foothill and/or steep mountainous terrain, very low population density, and an attractive and unspoiled natural environment.

Reaches of the Tuolumne and Merced Rivers in the extended plan area are classified as wild and scenic (see Section 10.3.1, *Federal [Regulatory Background]*, for more information about the National Wild and Scenic Rivers Act); the Stanislaus River in the extended plan area is not classified as wild and scenic (National Wild and Scenic Rivers System 2016). A total of 122 miles of the Merced River is designated, with 71 designated as wild, 16 designated as scenic, and 35.5 miles designated as recreational. A total of 83 miles of the Tuolumne River is designated with 47 miles designated as wild, 23 miles designated as scenic, and 13 miles designated as recreational. Both rivers generally offer recreationists and other viewers uninterrupted views of the natural landscape that consist of glaciated peaks, lakes, and alpine and subalpine meadows. Depending on the location in the extended plan area, there are also uninterrupted and extensive views of the Merced and Tuolumne Rivers. Flows on the Merced River are generally not controlled by reservoirs because there are no major reservoirs on the Merced River in the extended plan area. Since the Merced River is relatively free-flowing, flows are primarily influenced by weather patterns including winter snow accumulation, spring and summer snowmelt, and summer precipitation (Dettinger et al. 2004; Yosemite National Park 2013). Flows on the Tuolumne River are highly regulated, primarily by releases from the Hetch Hetchy Reservoir, and viewers are subjected to these regulated flows (National Wild and Scenic Rivers System 2016.) Although the Stanislaus River is not identified as wild and scenic, flows are also highly regulated by releases from large reservoirs, such as Spicer Meadow, Donnell, and Beardsley Reservoirs, and viewers are subjected to these regulated flows.

There are several designated scenic highway routes in the extended plan area, including State Route 4, State Route 140, and State Route 120 (Caltrans 2016). One of the largest viewer groups affected by changes along a state scenic highway is the travelers along the roadways. Many of the roadways in close proximity to the reservoirs and along the rivers serve as commercial and commuter routes, as well as scenic routes used by recreationists. Viewers who frequently commute via these roadways generally have low visual sensitivity to their surroundings. The passing landscape becomes familiar, and their attention is typically focused elsewhere. At standard roadway speeds, views are fleeting, and travelers are more aware of surrounding traffic, road signs, the automobile's interior, and other visual features of the environment. However, these roadways also may be traveled for their scenic qualities, and recreational travelers on such roadways are likely to have moderate sensitivity because they seek out such routes for their aesthetic viewsheds. Therefore, viewers traveling along state-designated scenic highways for recreational purposes are considered moderately sensitive to the views they experience because these views typically are comprised of specific aesthetic resources (e.g., landscapes with variable topography, trees, rocks and rivers). A highway may be designated scenic depending upon how much of the natural landscape can be seen by travelers, the scenic quality of the landscape, and the extent to which development intrudes upon the traveler's enjoyment of the view. The designated routes and their general visual character and quality are summarized below.

- State Route 4 (also known as Ebbetts Pass Highway) is officially designated as a State Scenic Highway and a National Scenic Byway for approximately 56 miles in Calaveras and Alpine Counties in the extended plan area (Caltrans 2016; DOT 2016). It extends northward from Calaveras County, east of Arnold, to the Alpine County line, and then to State Route 89 (Caltrans 2016). This route traverses through forests of aspen, cedar, pine, fir, and tamarack; across high mountain meadows; around glacial lakes; and along mountain streams as it winds its scenic way above the canyon of the North Fork of the Stanislaus River (Caltrans 2016.). Throughout the

length of the route are a number of spectacular vistas of far-off mountain peaks with intervening canyons plunging several thousand ft below the highway (Caltrans 2016.). Given the uninterrupted and relatively intact natural landscape and the sweeping views that can be experienced by drivers this route offers viewers a relatively high visual quality experience.

- State Route 140 is officially designated as a State Scenic Highway for approximately 27 miles in Mariposa County in the extended plan area (Caltrans 2016). It extends northward from the Mariposa Town planning area to the west boundary of the El Portal town planning area (Caltrans 2016). It climbs from oak woodlands in the Sierra foothills through the scenic and historic Merced River Canyon to Yosemite National Park (Caltrans 2016). Similar to Route 4, this route offers viewers a relatively high visual quality experience.
- State Route 120 is officially designated as a Connecting Federal Highway and National Scenic Byway in Mariposa County (County of Mariposa 2006). This route is within Yosemite National Park and offers views of Merced River Canyon and the park. Similar to State Routes 4 and 140, this route also offers viewers a relatively high visual quality experience.

There are two eligible scenic highways in the extended plan area: State Routes 49 and 108. State Route 49 extends through Calaveras, Tuolumne, Marisposa, and Madera Counties within the general proximity of the Stanislaus River, New Melones Reservoir, and Tulloch Reservoir; the Tuolumne River and New Don Pedro Reservoir; and the Merced River, Lake McClure, and New Exchequer Dam (Caltrans 2011). The eligible portion of State Route 49, traveling from north to south, begins in Calaveras County, crosses New Melones Reservoir, the Tuolumne County line, the Tuolumne River as the river enters New Don Pedro Reservoir, the Merced River as it enters Lake McClure, and extends to the southern Mariposa County line (Caltrans 2011). Views available to viewers using the roadway generally consist of the eastern Sierra Nevada, comprised of variable topography (mountains, hills, valleys, meadows), trees, rocks, etc. Some rural residential buildings are interspersed along this route along with small towns. The following reservoirs and rivers are visible as the road crosses them: New Melones Reservoir in Calaveras County, Tuolumne River in Tuolumne County, and the Merced River in Mariposa County. The Stanislaus River and Tulloch Reservoir are generally not visible from this route because of intervening landscape and topography (e.g., elevation changes associated with hills and trees). The surface water elevation in the reservoirs is influenced by seasonal changes and the seasonal operation of the dams and this seasonal variation creates an area of exposed sediment with no vegetation growing (also known as the fluctuation zone).The eligible portion of State Route 108 begins at the junction of State Route 49, east of New Melones and New Don Pedro Reservoirs in the extended plan area, and travels past Sonora to the northern Tuolumne County line (Caltrans 2011). Visibility of the south fork of the Stanislaus River is generally limited due to distance and intervening topography; however, views of other reservoirs in the extended plan area (e.g., Donnell Lake) are afforded to drivers.

The extended plan area primarily includes major portions of the Stanislaus National Forest and all of Yosemite National Park (USFS 2016a). A small portion of the Sierra National Forest is located in the south portion of the extended plan area along the South Fork Merced River in Mariposa and Madera Counties. The extended plan area is bordered by the Humboldt-Toiyabe National Forest and the Inyo National Forest to the west and south. The Stanislaus and Tuolumne Rivers in the Stanislaus National Forest and the Tuolumne and Merced Rivers in Yosemite National Park are used for recreational purposes by a wide variety of different recreationists, including hikers, kayakers, campers, and anglers (USFS 2016b). In-river recreation is typically influenced by the operation of the upstream reservoirs on the Stanislaus and Tuolumne Rivers, similar to the plan area below the

three rim dams. For example, the Tuolumne River is well known for some of the most noted whitewater in the high Sierras and is an extremely popular rafting stream below the national park boundary of Yosemite. It is one of the most challenging river runs in California. All private floaters, kayakers, and rafters must obtain permits between May 1 and October 15. Typically, the best floating occurs May through September. However, river flows can be particularly high in the spring, and between the end of the high spring runoff and the beginning of September, the flows on the river are heavily determined by the releases from the Hetch Hetchy Reservoir. Generally flows are high for boaters in the early morning and remain high, and then are reduced to minimum flows in the afternoon. In addition to the in-water activities on the upper Tuolumne River, there are many campsites available to private citizens on a first-come, first-serve basis. (National Wild and Scenic River Systems 2016.)

The reservoirs in the extended plan area are typically smaller than those in the plan area. They generally have less urban and suburban infrastructure around them and offer relatively intact views of the natural landscape including the water vegetation interface along the edge of the reservoirs. The reservoirs offer numerous recreational opportunities. There are numerous recreational opportunities in the extended plan area as it primarily consists of national forests and parks. Recreation at the Stanislaus and Tuolumne River reservoirs in the extended plan area include non-motorized boating, fishing, swimming and camping (USFS n.d.). The Stanislaus National Forest plan has a range of standards and guidelines addressing rural, semi-primitive motorized and primitive recreation (Stanislaus National Forest 2010).

10.2.4 Southern Delta

The majority of the land within the Delta is privately owned, which reduces the availability of land-based recreation (Delta Protection Commission 2010). Navigable waterways in the Delta, however, are publicly accessible and currently constitute the majority of available recreational opportunities (Delta Protection Commission 2010). The southern Delta, specifically, encompasses miles of navigable channels along the San Joaquin, Middle, and Old Rivers. The Clifton Court Forebay, the SWP primary collection reservoir is located northwest of the southern Delta (The Dangermond Group and LSA Associates 2006).

Both privately owned and publicly operated marinas exist throughout the area, including ~~Durham Ferry SRA,~~ Mossdale Marina, Dos Reis Park, Haven Acres Marina, and Tracy Oasis Marina. In addition to boating amenities, these locations provide opportunities for various shore activities, such as fishing and hiking.

A recreation survey conducted by the Department of Recreation in 1996 found that waterskiing, boat cruising, fishing, and swimming were the most popular water-dependent activities in the southern Delta. Of water-enhanced activities, sightseeing was the most common, followed closely by fishing from shore and viewing wildlife (Delta Protection Commission 1997). Sport fishing in the Delta occurs year-round and may take place on private vessels or from shore. Popular sport fish include striped bass, white sturgeon, salmon, American shad, catfish, and largemouth bass (USBR 1999).

The 1996 survey found that recreational use of the southern Delta is proportionally less than the recreational use in other regions of the Sacramento–San Joaquin Delta. The southern Delta is currently estimated to support only 11 percent of the total boating use in the Delta. There are fewer boating and water-associated facilities in the southern Delta compared to the adjoining portions of

the Delta to the north. In 2000, an estimated 6.4 million visitor days were associated with boating throughout the Delta (Division of Boating and Waterways 2003).

The water flows in the southern Delta are heavily managed because Central Valley Project (CVP) and SWP pumps are located along the western boundary of the southern Delta. The volume of water in the navigable waterways and the relative quantity of navigable waterways influence available recreational opportunities in the southern Delta. Many of the channels are currently impassable due to snags and vegetation encroachment (Delta Protection Commission 1997). Additionally, during heavy flows, sediment and debris can accumulate, affecting the navigability of the channels and the viability of marinas. Salinity conditions in the southern Delta do not influence the water-dependent or water-enhanced recreational opportunities.

10.3 Regulatory Background

10.3.1 Federal

Relevant federal laws, programs, policies, or regulations related to recreation and/or aesthetics are described below.

Federal Power Act

The Federal Power Act requires the Federal Energy Regulatory Commission (FERC) to give equal consideration to the protection of recreational opportunities and other values when licensing hydropower facilities within its jurisdiction. New Don Pedro and New Exchequer Dams are under FERC's jurisdiction.

Clean Water Act

Section 401 of the federal Clean Water Act requires any applicant for a federal license or permit to conduct any activity, which may result in any discharge to navigable waters, to obtain water quality certification from the State Water Board that the discharge will comply with specified provisions of the Clean Water Act. In issuing water quality certification, the State Water Board certifies that the project will comply with specified provisions of the Clean Water Act, including water quality standards developed pursuant to state law. Water quality standards include beneficial uses, such as recreation. Conditions of certification become conditions of any federal license or permit for the project.

Sierra Resource Management Plan of 2008

Consistent with the Federal Land Policy and Management Act, BLM prepared the Sierra Resource Management Plan to set goals and objectives for various resources, including recreation and aesthetics, on land BLM owns and operates. ~~BLM owns and operates New Exchequer Dam and Lake McClure on the Merced River, New Don Pedro Dam on the Tuolumne River, and portions of land surrounding the reservoirs.~~ This management plan identifies the Lake McClure/Highway 49 and New Melones Reservoir/Stanislaus River viewsheds as Class II visual resources and the Don Pedro Reservoir/Highway 49 viewshed as a Class III visual resource. The plan's objectives include maintaining the existing visual quality of these resources and providing for continued availability

of outdoor recreational opportunities while protecting other resources and uses. Specifically, Class II views have an objective to retain the existing character of the landscape and to keep levels of change to the characteristic landscape low. Class III views have an objective to partially retain existing characteristics and moderate changes to the characteristic landscape are acceptable (BLM 2008).

Water and Land Recreation Opportunity Spectrum User's Handbook of 2011

USBR prepared a handbook establishing the Water and Land Recreation Opportunity Spectrum as a tool to understand the type and location of six types of water-related recreation opportunities, which include urban, suburban, rural developed, rural natural, semi-primitive, and primitive recreation opportunities. A particular "package" of activities, setting attributes, experiences, and benefits defines each type. New Melones Reservoir, operated by USBR, has three types: rural developed, rural natural, and semiprimitive. The visual quality objectives of these three types include modification, partial retention, and retention, respectively (USBR 2011a).[5]

New Melones Lake Area Resource Management Plan

The Resource Management Plan (RMP) provides a range of alternatives for managing USBR-administered lands within the New Melones Lake Area. The RMP addresses the interrelationships among the various resources at the New Melones Lake Area and provides options to balance resource management with public use and USBR's mission and authority.

U.S. Forest Service Scenery Management Handbook

Scenery management in the Stanislaus National Forest, which covers much of the extended plan area, is addressed by the *Forest Service Scenery Management Handbook* (USFS 1995). The objective of managing all lands to attain the highest possible visual quality commensurate with other appropriate public uses, costs, and benefits (USFS 2004).

National Wild and Scenic Rivers Act

The Wild and Scenic Rivers Act of 1968 established the National Wild and Scenic River System to preserve certain rivers with outstanding natural, cultural, and recreational values in a free-flowing conditions for the enjoyment of present and future generations. Approximately 2,000 river miles in California have been designated as wild and scenic. This is approximately 1 percent of the state's river miles. Rivers are classified as wild, scenic, or recreational depending on the characteristics of the river (National Wild and Scenic Rivers System 2016).

The definitions of wild, scenic, and recreational as defined by the act are as follows.

- Wild: Those rivers, or sections of rivers, free of impoundments and generally inaccessible except by trail, with watersheds or shorelines essentially primitive and waters unpolluted. These represent vestiges of primitive America.
- Scenic: Those rivers, or sections of rivers, free of impoundments, with shorelines or watersheds still largely primitive and shorelines largely undeveloped, but accessible in places by roads.

[5] New Don Pedro Dam and New Exchequer Dam are not operated by USBR.

- Recreational: Those rivers, or sections of rivers, readily accessible by road or railroad, that may have some development along their shorelines, and that may have undergone some impoundment or diversion in the past.

10.3.2 State

Relevant state programs, policies, or regulations related to recreation and/or aesthetics are described below.

Porter-Cologne Water Quality Control Act

The Porter-Cologne Water Quality Control Act is California's comprehensive water quality control law and is a complete regulatory program designed to protect water quality and beneficial uses of the state's water. It requires by adoption of water quality control plans by the state's nine regional water quality control boards for watersheds within their regions. The State Water Board may also adopt water quality control plans.

San Francisco Bay/Sacramento–San Joaquin Delta Estuary Water Quality Control Plan

The State Water Board's 2006 Bay-Delta Plan identifies beneficial uses of water in the Bay-Delta to be reasonably protected, water quality objectives for the reasonable protection of beneficial uses. Recreation is one of the designated beneficial uses of surface water bodies, including the LSJR and its three eastside tributaries.

California State Scenic Highway Program

California's Scenic Highway Program was created by the legislature in 1963. Its purpose is to protect and enhance the natural scenic beauty of California highways and adjacent corridors through special conservation treatment. A highway may be designated scenic depending on how much of the natural landscape can be seen by travelers, the scenic quality of the landscape, and the extent to which development intrudes upon the traveler's enjoyment of the view (Caltrans 2016).

10.3.3 Regional or Local

Relevant regional or local programs, policies, or regulations related to recreation and/or aesthetics are described below. Although local policies, plans and regulations are not binding to the State of California, below is a description of relevant ones.

Mariposa County General Plan

Chapter 12 of the *County of Mariposa General Plan* includes goals and policies to achieve local recreation service, create programs to provide a range of recreation opportunities and facilities, and cooperate with regional agencies in the development of recreation opportunities. The general plan also contains policies that provide for the establishment of measures for the protection of large-scale views and viewsheds through comprehensive development standards. Standards must take into account the scenic aspect of the county to conserve designated views and viewsheds.

Merced General Plan

The *Recreation and Cultural Resources Element* of the *2030 Merced County General Plan* sets goals and policies to achieve its vision for recreational opportunities. The goals and policies are meant to preserve, enhance, expand, and manage Merced County's system of regional parks, trails, and natural resources.

Tuolumne County General Plan

Chapter 8 of the *Tuolumne County General Plan* includes goals and policies to provide adequate and equitable distribution of recreation facilities, cooperate with other public agencies and private enterprises to provide recreation facilities, acquire and develop land for recreation facilities, and obtain revenue sources to fund recreation. One of the goals of the Tuolumne County General Plan *Conservation and Open Space Element* is to conserve the scenic environment and rural character of the county. The policies for preserving scenic resources address the history of agricultural and timberlands, the natural scenic quality and rural character along designated transportation routes, conserving the natural scenic quality of hillsides and hilltops, and voluntary efforts to protect clusters of native trees and conserve the county's scenic resources.

Stanislaus County General Plan

Chapter 3 of the *Stanislaus County General Plan* emphasizes the conservation and management of natural resources and the preservation of open space for outdoor recreation. It sets goals and policies to maintain the natural environment in areas dedicated as parks and open space and to provide for the open-space recreational needs of the residents of the county.

Calaveras County General Plan

The *Open Space Element* of the *Calaveras County General Plan* states there are significant topographic variations and several resources which contribute to scenic quality. The primary attributes include the lakes, rivers and streams, rolling hills with oak habitat, ridgelines, and forests.

San Joaquin County General Plan

Goals of the *San Joaquin County General Plan* include the preservation of open space for recreation, encouraging the use of waterways for recreation, recognition of scenic routes within the county, providing that water-diversion projects ensure adequate water for recreation, and recognizing that local vegetation communities are important to the recreational experience.

10.4 Impact Analysis

This section identifies the thresholds or significance criteria used to evaluate the potential impacts on recreational resources and aesthetics. It further describes the methods of analysis used to determine significance. Measures to mitigate (i.e., avoid, minimize, rectify, reduce, eliminate, or compensate for) significant impacts accompany the impact discussion, if any significant impacts are identified.

10.4.1 Thresholds of Significance

The thresholds for determining the significance of impacts for this analysis are based on the State Water Board's Environmental Checklist in Appendix A of the State Water Board's CEQA regulations. (23 California Code of Regulations [Cal. Code Regs.], §§ 3720–3781.) The thresholds derived from the checklist were modified, as appropriate, to refine the analysis and more accurately describe the impacts of the alternatives. The recreational resource and aesthetic impacts, which were determined as potentially significant in the State Water Board's Environmental Checklist (see Appendix B, *State Water Board's Environmental Checklist*), are discussed in this analysis as to whether the alternatives could result in the following:

- Substantially physically deteriorate existing recreational facilities on the rivers or at the reservoirs.
- Substantially degrade the existing visual character or quality of the reservoirs.
- Have a substantial adverse effect on a scenic vista.
- Substantially damage scenic resources, including trees, rock outcroppings, and historic buildings within a state scenic highway.

Where appropriate specific quantitative or qualitative criteria are described in Section 10.4.2, *Methods and Approach*, for evaluating these thresholds.

As discussed in Appendix B, the new flow requirements would not significantly degrade the visual character or quality of the rivers within the landscape because flows would generally be within the baseline historical range. Viewers would not be sensitive to any changes in flows and associated visual changes. Therefore, potential impacts on the visual character or quality of the riverine landscape are not discussed in this chapter. In addition, as indicated in Appendix B, the LSJR and SDWQ alternatives would have either no impact or less than significant impacts on the following areas related to recreational resources and aesthetics and, therefore, are not discussed within this chapter.

- Increase the use of existing neighborhood and regional parks or other recreational facilities such that substantial physical deterioration of the facilities would occur or be accelerated.
- Include recreational facilities or require the construction or expansion of recreational facilities that might have an adverse physical effect on the environment.
- Create a new source of substantial light or glare which would adversely affect day or nighttime views in the area.

10.4.2 Methods and Approach

This chapter evaluates the potential recreation and visual quality impacts associated with the LSJR alternatives using modeling results from the State Water Board's Water Supply Effects (WSE) model for flows and reservoir elevations (Chapter 5, *Surface Hydrology and Water Quality*, and Appendix F.1, *Hydrologic and Water Quality Modeling*). The modeling results for the LSJR alternatives are compared to the baseline modeled conditions. Recreation surveys were not conducted for the analysis, and existing setting information is based on the most recent available information regarding recreational opportunities at the LSJR, three eastside tributaries, and reservoirs.

The results of the hydrologic modeling are presented below, along with an assessment of the implications of the modeled results for potential impacts on recreation. The analysis identifies the frequency with which flow ranges support different types of flow-dependent recreational activities. Reservoir elevation levels predicted from the hydrologic modeling also are used to determine if the exposed shoreline would modify the aesthetics (i.e., visual character and quality) of the reservoirs experienced by recreationists. The impact analysis then qualitatively discusses if the LSJR alternatives would substantially impact recreation or substantially degrade the visual character and quality of the reservoirs.

This chapter evaluates the potential recreation and aesthetic impacts associated with the LSJR alternatives. Each LSJR alternative includes a February–June unimpaired flow[6] requirement (i.e., 20, 40, or 60 percent) and methods for adaptive implementation to reasonably protect fish and wildlife beneficial uses, as described in Chapter 3, *Alternatives Description*. In addition, a minimum base flow is required at Vernalis at all times during this period. The base flow may be adaptively implemented as described below and in Chapter 3. State Water Board approval is required before any method can be implemented, as described in Appendix K, *Revised Water Quality Control Plan*. All methods may be implemented individually or in combination with other methods, may be applied differently to each tributary, and could be in effect for varying lengths of time, so long as the flows are coordinated to achieve beneficial results in the LSJR related to the protection of fish and wildlife beneficial uses.

The Stanislaus, Tuolumne, and Merced Working Group (STM Working Group) will assist with implementation, monitoring, and assessment activities for the flow objectives and with developing biological goals to help evaluate the effectiveness of the flow requirements and adaptive implementation actions. The STM Working Group may recommend adjusting the flow requirements through adaptive implementation if scientific information supports such changes to reasonably protect fish and wildlife beneficial uses. Scientific research may also be conducted within the adaptive range to improve scientific understanding of measures needed to protect fish and wildlife and reduce scientific uncertainty through monitoring and evaluation. Further details describing the methods, the STM Working Group, and the approval process are included in Chapter 3 and Appendix K.

Without adaptive implementation, flow must be managed such that it tracks the daily unimpaired flow percentage based on a running average of no more than 7 days. The four methods of adaptive implementation are described briefly below.

1. Based on best available scientific information indicating that more flow is needed or less flow is adequate to reasonably protect fish and wildlife beneficial uses, the specified annual February–June minimum unimpaired flow requirement may be increased or decreased to a percentage within the ranges listed below. For LSJR Alternative 2 (20 percent unimpaired flow), the percent of unimpaired flow may be increased to a maximum of 30 percent. For LSJR Alternative 3 (40 percent unimpaired flow), the percent of unimpaired flow may be decreased to a minimum of 30 percent or increased to a maximum of 50 percent. For LSJR Alternative 4 (60 percent

[6] *Unimpaired flow* represents the water production of a river basin, unaltered by upstream diversions, storage, or by export or import of water to or from other watersheds. It differs from natural flow because unimpaired flow is the flow that occurs at a specific location under the current configuration of channels, levees, floodplain, wetlands, deforestation and urbanization.

unimpaired flow), the percent of unimpaired flow may be decreased to a minimum of 50 percent.

2. Based on best available scientific information indicating a flow pattern different from that which would occur by tracking the unimpaired flow percentage would better protect fish and wildlife beneficial uses, water may be released at varying rates during February–June. The total volume of water released under this adaptive method must be at least equal to the volume of water that would be released by tracking the unimpaired flow percentage from February–June.

3. Based on best available scientific information, release of a portion of the February–June unimpaired flow may be delayed until after June to prevent adverse effects to fisheries, including temperature that would otherwise result from implementation of the February–June flow requirements. The ability to delay release of flow until after June is only allowed when the unimpaired flow requirement is greater than 30 percent. If the requirement is greater than 30 percent but less than 40 percent, the amount of flow that may be released after June is limited to the portion of the unimpaired flow requirement over 30 percent. For example, if the flow requirement is 35 percent, 5 percent may be released after June. If the requirement is 40 percent or greater, then 25 percent of the total volume of the flow requirement may be released after June. As an example, if the requirement is 50 percent, at least 37.5 percent unimpaired flow must be released in February–June and up to 12.5 percent unimpaired flow may be released after June. ~~If after June the STM Working Group determines that conditions have changed such that water held for release after June should not be released by the fall of that year, the water may be held until the following year.~~ See Chapter 3 and Appendix K for further details.

4. Based on best available scientific information indicating that more flow is needed or less flow is adequate to reasonably protect fish and wildlife beneficial uses, the February–June Vernalis base flow requirement of 1,000 cfs may be modified to a rate between 800 and 1,200 cfs.

The operational changes made using the adaptive implementation methods above may be approved if the best available scientific information indicates that the changes will be sufficient to support and maintain the natural production of viable native SJR Watershed fish populations migrating through the Delta and meet any biological goals. The changes may take place on either a short-term (for example monthly or annually) or longer-term basis. Adaptive implementation is intended to foster coordinated and adaptive management of flows based on best available scientific information in order to protect fish and wildlife beneficial uses. Adaptive implementation could also optimize flows to achieve the objective, while allowing for consideration of other beneficial uses, provided that these other considerations do not reduce intended benefits to fish and wildlife. While the measures and processes used to decide upon adaptive implementation actions must achieve the narrative objective for the reasonable protection of fish and wildlife beneficial uses, adaptive implementation could result in flows that would benefit or reduce impacts on other beneficial uses that rely on water. For example, terrestrial riparian species could benefit by receiving additional flows during key germination times in the late spring.

The quantitative results included in the figures, tables, and text of this chapter present WSE modeling of the specified unimpaired flow requirement for each LSJR alternative (i.e., 20, 40, or 60 percent). The modeling does allow some inflows to be retained in the reservoirs after June, as could occur under adaptive implementation method 3, to prevent adverse temperature effects and this is included in the results presented in this chapter. If the percent of unimpaired flow is not specified in this chapter, these are the percentages of unimpaired flow evaluated in the impact

analysis. However, as part of adaptive implementation, method 1 would allow the required percent of unimpaired flow to change by up to 10 percent if the STM Working Group agrees to adjust it. The highest possible percent of unimpaired flow associated with an LSJR alternative is also evaluated in the impact analysis if long-term implementation of method 1 has the potential to affect a determination of significance. For example, if the determination for LSJR Alternative 3 at 40 percent unimpaired flow is less than significant, but the determination for LSJR Alternative 4 at 60 percent unimpaired flow is significant, then LSJR Alternative 3 is also evaluated at 50 percent unimpaired flow. This use of modeling provides information to support the analysis and evaluation of the effects of the alternatives and adaptive implementation. For more information regarding the modeling methodology and quantitative flow and temperature modeling results, see Appendix F.1, *Hydrologic and Water Quality Modeling*.

LSJR and Tributary Modeling Methodology and Results

Streamflow affects the recreational water-based opportunities in the rivers below the rim dams. Recreational use of the LSJR and its tributaries occurs year-round, although the most frequent use is during the warmer spring and summer months. Therefore, the effects of the proposed changes in river flows are analyzed for the months of May–September. Unacceptable flows can occur when flows are lower than optimal for boating or swimming or when flows are too high and result in potentially unsafe velocities. Higher flows may also inundate and reduce access to existing on-bank recreation facilities (e.g., campsites).

For in-water recreational opportunities, the flow for different known activities on each of the rivers is compared to the expected modeled flow under each of the alternatives to determine how often the expected modeled flow would fall within the flow ranges. Although optimal flows vary for each river based on hydrologic and geologic conditions, flows can generally be classified into the following optimal flow ranges to evaluate the hydrologic modeling results.

- Less than 500 cfs for swimming, floating, canoeing and kayaking.
- Between 500 and 1,500 cfs for motorized boating, rafting, and kayaking.
- Between 1,500 and 2,500 cfs for advanced rafting or kayaking.

A flow above 2,500 cfs is generally considered unsafe for recreational activities, although advanced whitewater rafting and kayaking often still take place.

The WSE model results are presented as monthly distributions of river flows to provide the basis for the evaluation of potential impacts on recreational opportunities and visual experiences. Average monthly flow conditions that would result from LSJR Alternatives 2, 3, and 4 during the summer recreation season are compared to baseline conditions to determine the magnitude and frequency of the changes in flows that support recreation.

Potential recreation impacts were determined using the WSE model results in a three-step procedure. The first step described recreational opportunities in May–September (i.e., the recreation season) with values for the acceptable range of flows known to support recreation. The second step calculated the frequency of monthly flows that are within this range, based on the monthly WSE model results. In step three, for LSJR Alternatives 2, 3, and 4, the frequency of flows (or reservoir elevations) within this optimal range was then compared to those associated with the baseline. As described in Chapter 5, *Surface Hydrology and Water Quality*, baseline was developed using an 82-year simulation period.

The results of this assessment are presented below, first using the Merced River as an example (Tables 10-2 through 10-4). Summary tables are then presented for the Tuolumne River (Table 10-5) and Stanislaus River (Table 10-6). If the frequency of flows generally supporting a specific recreational activity would decrease more than 10 percent when averaged over the summer recreation season (i.e., the seasonal monthly average frequency of flows within a range that supports a type of recreation would decrease more than 10 percent) a significant impact on a particular type of river recreation may be identified.

The alteration of flow under the LJSR alternatives would not constitute a significant change in visual quality because expected flows are generally within the historical range and views are not as sensitive to these changes. Furthermore, the LSJR alternatives would not influence flood flows currently produced by the rim dams and would reduce the frequency of low flows during critical and critically dry years. Therefore, visual character and quality of the rivers are not discussed further.

Merced River

Common water-dependent recreational activities on the Merced River include swimming, boating, fishing, rafting, and kayaking. Tables 10-2 to 10-4 show the baseline flows suitable for recreation on the Merced River. Table 10-2 gives the full range of monthly flows in the cumulative distribution[7] format, using 10 percent increments from the minimum flow (at the top) to the maximum flow (at the bottom), with the average monthly flow below the maximum value. Table 10-3 shows the percentage of the years that the monthly flows were greater than specified flows of 250–2,500 cfs, in increments of 250 cfs. Tables 10-2 and 10-3 are shown as examples of the type of flow frequency information that is used to generate the summary tables for recreational flow frequencies for each river (i.e., Tables 10-4, 10-5, and 10-6).

Table 10-4 shows the percentage of the years when the Merced River monthly flows were within the four ranges of flows for recreation (e.g., less than 500 cfs, between 500 and 1,500 cfs, etc.) for baseline and the LSJR alternatives. The frequency percentages for the peak recreation season months and the average percentages are shown for all alternatives.

As identified in Table 10-4, the seasonal monthly averages indicate that flows were suitable for swimming in 72 percent of the years, rafting and motorized boating 18 percent of the years, advanced kayaking in 5 percent of the years, and were too high for anything except whitewater boating in 6 percent of the years. The LSJR alternatives would change the Merced River flows primarily in May and June, with less frequent average monthly flows (i.e., less than 500 cfs) and more frequent higher flows. Changes during the months of July–September were smaller. For July and August, the LSJR alternatives had the opposite effect than what they had for May and June; average monthly flows of less than 500 cfs increased, whereas higher flows decreased. The effects of LSJR Alternatives 3 and 4 on river flow during September showed a decrease in the frequency of the lowest flows, as a result of adaptive implementation method 3. For the Merced River, the LSJR

[7] The cumulative distribution of a particular variable (i.e., reservoir elevations) provides a basic summary of the distribution of values. This term is not referring to, and should not be confused with, the term cumulative impacts, which is a specific CEQA term. A discussion of cumulative impacts for CEQA purposes is provided Chapter 15, *No Project Alternative (LSJR Alternative 1 and SDWQ Alternative 1)*; Chapter 16, *Evaluation of Other Indirect and Additional Actions;* and Chapter 17, *Cumulative Impacts, Growth-Inducing Effects, and Irreversible Commitment of Resources.*

alternatives are not expected to have a large effect on the frequency of river flows above 2,500 cfs, except in May under LSJR Alternative 4.

The modeled seasonal average frequency of all flow ranges would generally increase or stay the same under all of the alternatives when compared to baseline, except the frequency of flows less than 500 cfs under LSJR Alternatives 3 and 4, which would decrease to 53 percent and 46 percent, respectively.

Table 10-2. Monthly Cumulative Distributions of Merced River Flow (cubic feet per second [cfs]) at Stevinson for Baseline Conditions (WSE Model Results for 1922–2003)

Percentile	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep
Minimum	280	220	220	220	220	220	0	75	25	25	25	25
10	280	239	239	252	243	220	75	75	25	25	25	25
20	311	252	259	267	261	241	103	100	25	25	25	41
30	330	268	269	275	284	262	189	167	35	43	49	64
40	342	281	278	288	369	278	297	282	76	64	73	84
50	354	291	288	323	526	305	495	439	97	87	90	105
60	365	317	304	374	674	316	541	561	111	113	116	130
70	380	330	335	543	1,118	585	621	668	180	379	813	347
80	416	357	371	1,206	1,925	1,022	745	1,045	1,322	1,241	969	459
90	472	477	1,026	1,676	3,058	1,727	928	2,485	2,986	2,120	1,159	537
Maximum	1,084	2,180	3,495	9,859	5,151	5,959	4,825	5,374	7,279	5,871	2,392	1,263
Average	384	373	496	808	1,132	756	548	797	794	642	422	239

Table 10-3. Percentage of Years with Merced River Flow (cubic feet per second [cfs]) Greater than Specified Flows within the Recreation Range Baseline Conditions (WSE Model Results for 1922–2003)

Flow	Oct	Nov	Dec	Jan	Feb	Mar	Apr	May	June	July	Aug	Sep
250	98	94	95	96	98	96	78	70	40	30	33	33
500	16	7	13	34	48	32	51	46	24	24	30	16
750	4	5	11	22	38	24	22	29	22	23	27	4
1000	2	2	11	17	29	20	10	18	21	21	18	4
1250	1	2	7	15	26	16	6	16	21	20	7	1
1500	0	2	6	11	24	12	4	15	20	17	2	0
1750	0	1	6	7	20	11	4	12	18	13	1	0
2000	0	0	4	6	15	9	4	12	17	11	1	0
2250	0	0	2	5	11	6	1	11	16	7	1	0
2500	0	0	2	5	11	6	1	11	13	6	0	0

Table 10-4. Percentage of Years with Monthly Merced River Flows within Specified Recreational Ranges (cubic feet per second [cfs]) (WSE Model Results for 1922–2003)

	Months					
Range of Flow	May	June	July	Aug	Sept	Seasonal Average
Baseline						
<500	54	76	76	70	84	72
500–1,500	32	5	7	28	16	18
1,500–2,500	4	6	11	2	0	5
>2,500	11	13	6	0	0	6
LSJR Alternative 2						
<500	24	51	77	72	84	62
500–1,500	61	28	6	26	16	27
1,500–2,500	4	7	11	2	0	5
>2,500	11	13	6	0	0	6
LSJR Alternative 3						
<500	2	29	77	77	78	53
500–1,500	51	50	7	21	22	30
1,500–2,500	35	10	10	2	0	11
>2,500	11	11	6	0	0	6
LSJR Alternative 3 with Adaptive Implementation (50% Unimpaired Flow)						
>2,500	16	12	5	0	0	7
LSJR Alternative 4						
<500	1	17	71	71	71	46
500–1,500	23	38	21	27	29	28
1,500–2,500	40	29	4	2	0	15
>2,500	35	16	5	0	0	11

Notes:
The sum of percentages for each month may not equal 100 due to rounding of values for each flow range.
Gray cells indicate a decrease in the seasonal average greater than 10 percent relative to baseline.
Outlined cells in the table indicate an increase in the seasonal average greater than 10 percent relative to baseline.

Tuolumne River

Common water-dependent recreational activities on the Tuolumne River include boating, fishing, swimming, rafting and kayaking. Table 10-5 shows the percentage of years over the 82-year simulation period in which flows are within specified recreational ranges. The LSJR alternatives are expected to change the Tuolumne River flows in May and June, with flows tending to increase progressively with each LSJR alternative. For example, in June, each of the LSJR alternatives is expected to cause a substantial reduction in the frequency of flows less than 500 cfs. For LSJR Alternative 2, some of the flows would shift from less than 500 cfs under baseline to the 500-1,500 cfs range, whereas for LSJR Alternatives 3 and 4, the flows shift to a range greater than 1,500 cfs. LSJR Alternatives 3 and 4 would cause a large increase in the frequency of flows over 2,500 cfs in May and June. The alternatives generally would cause only small changes in river flows

from July–September, except for LSJR Alternative 4, which is expected to cause a moderate decrease in flows greater than 2,500 cfs and an increase in flows from 500–1,500 cfs in July.

The modeled seasonal average flow frequencies show increases in flow under all of the alternatives when compared to baseline. As a result, the frequency of flows less than 500 cfs under LSJR Alternatives 3 and 4 would decrease more than 10 percent to 33 percent and 32 percent, respectively. In addition, the modeled seasonal average frequency of flows of greater than 2,500 cfs would increase more than 10 percent to 23 percent under LSJR Alternative 3 and to 31 percent under LSJR Alternative 4.

Table 10-5. Percentage of Years with Monthly Tuolumne River Flows within Specified Recreational Ranges (cubic feet per second [cfs]) (WSE Model Results for 1922–2003)

	Months					
Range of Flow	May	Jun	Jul	Aug	Sep	Seasonal Average
Baseline						
<500	6	50	51	57	59	45
500–1,500	63	24	30	40	39	40
1,500–2,500	13	6	4	1	2	5
>2,500	17	20	15	1	0	10
LSJR Alternative 2						
<500	1	23	51	57	59	38
500–1,500	52	45	32	40	39	42
1,500–2,500	29	13	2	1	2	10
>2,500	17	18	15	1	0	10
LSJR Alternative 3						
<500	0	9	50	52	52	33
500–1,500	13	23	35	45	45	32
1,500–2,500	29	26	2	1	2	12
>2,500	57	43	12	1	0	23
LSJR Alternative 3 with Adaptive Implementation (50% Unimpaired Flow)						
>2,500	77	56	6	1	0	28
LSJR Alternative 4						
<500	0	5	50	52	52	32
500–1,500	2	18	44	45	45	31
1,500–2,500	13	12	1	2	2	6
>2,500	84	65	5	0	0	31

Notes:
The sum of percentages for each month may not equal 100 due to rounding of values for each flow range.
Gray cells in the table indicate a decrease in the seasonal average greater than 10 percent relative to baseline.
Outlined cells in the table indicate an increase in the seasonal average greater than 10 percent relative to baseline.

Stanislaus River

Common water-dependent recreational activities on the Stanislaus River include boating, fishing, swimming, rafting, and kayaking. Table 10-6 shows the percentage of years when monthly Stanislaus River flows would be within the specific recreational ranges. LSJR Alternative 2 would be expected to have only a small effect on Stanislaus River flows. LSJR Alternatives 3 and 4 would be expected to increase average monthly Stanislaus River flows in May and June, with more frequent average monthly flows over 1,500 cfs in May for LSJR Alternative 3 and more frequent average monthly flows over 2,500 cfs in May and, to a lesser extent, in June (over 1,500 cfs) for LSJR Alternative 4. The alternatives generally would have little effect on river flows July–September, although there would be a moderate increase in flows from 500–1,500 cfs for LSJR Alternative 3. The modeled seasonal average frequency of all flow ranges would generally change little under all of the alternatives when compared to baseline. However, the modeled seasonal average frequency of flows of greater than 2,500 cfs would increase by more than 10 percent to 14 percent under LSJR Alternative 4.

Table 10-6. Percentage of Years with Monthly Stanislaus River Flows within Specified Recreational Ranges (cubic feet per second [cfs]) (WSE Model Results for 1922–2003)

	Months					
Range of Flows	May	June	July	Aug	Sep	Seasonal Average
Baseline						
<500	9%	35%	62%	72%	72%	50%
500–1,500	48%	48%	37%	26%	24%	36%
1,500–2,500	43%	16%	0%	1%	1%	12%
>2,500	1%	1%	1%	1%	2%	1%
LSJR Alternative 2						
<500	5%	30%	59%	71%	70%	47%
500–1,500	55%	57%	40%	24%	24%	40%
1,500–2,500	40%	11%	0%	4%	4%	12%
>2,500	0%	1%	1%	1%	2%	1%
LSJR Alternative 3						
<500	2%	24%	55%	65%	63%	42%
500–1,500	33%	51%	44%	34%	34%	39%
1,500–2,500	51%	20%	0%	0%	1%	14%
>2,500	13%	5%	1%	1%	1%	4%
LSJR Alternative 3 with Adaptive Implementation (50% Unimpaired Flow)						
>2,500 cfs	40%	11%	0%	1%	1%	11%
LSJR Alternative 4						
<500	1%	16%	57%	67%	66%	41%
500–1,500	16%	33%	40%	32%	33%	31%
1,500–2,500	32%	33%	2%	1%	0%	14%
>2,500	51%	18%	0%	0%	1%	14%

The sum of percentages for each month may not equal 100 due to rounding of values for each flow range.
Outlined cells in the table indicate an increase in the seasonal average greater than 10 percent relative to baseline.

Lower San Joaquin River

Available data on the optimal flows on the LSJR do not follow the general trends described above for the eastside tributaries. Sources indicate that boating conditions are optimal at flows less than 750 cfs, while swimming and canoeing are best conducted when flows are less than 300 cfs (USBR 1997; Frago pers. comm.). Opportunities for land-based recreation are limited by flows and access.

Chapter 5, *Surface Hydrology and Water Quality*, and Appendix F.1, *Hydrologic and Water Quality Modeling*, present modeled flows on the SJR at Vernalis. Because the LSJR flows would be incrementally increased by inflow from the three eastside tributaries, the flows downstream at Vernalis are higher than those upstream (south of the confluence of the Merced River). At Vernalis, the SJR frequently experiences flows that are too high for any in-water recreation other than motorized boating or advanced kayaking and rafting (generally greater than 1,000 cfs in dry years). The hydrologic modeling predicts that LSJR flows would generally continue to be too high to support any in-water recreational opportunities under all alternatives.

LSJR Alternative Reservoir Modeling Methodology and Results

The evaluation of impacts on recreational opportunities at reservoirs is based on the reservoir water surface elevations. When critical low elevations are reached, boat ramps are no longer operational, marinas close, and camping and picnicking opportunities become limited by the small surface area of the reservoir available for recreation. Lower water levels can also reduce the visual character and quality of the reservoir's surroundings. Thus, although reservoirs are subject to a large variation in elevation associated with water releases, weather conditions, and seasonal changes, the quality of the recreation experience is best when the reservoir is full and elevation change is minimal.

Peak recreation seasons vary amongst reservoirs and predominate recreation uses. The majority of use typically occurs during the summer months, between Memorial Day and Labor Day. Thus, this recreation impact analysis focuses on May–September, the period of time when changes in water elevations are most likely to impact recreation.

Visual quality is evaluated qualitatively by identifying the existing visual setting (using the descriptions in Section 10.2.2, *Reservoirs*) of the reservoirs and their assigned visual classifications. It was then determined whether the change in elevation under LSJR Alternatives 2, 3, and 4 would result in a substantial degradation of visual quality. Table 10-7 identifies the visual classifications and the potential for modifying the existing visual setting.

Table 10-7. Summary of Visual Characteristics and Classifications

Reservoir	View Summary	Classification	Potential for Modification
Lake McClure[a]	Lake McClure and Highway 49 viewshed; the Sierra Nevada and aesthetics associated with foothills and mountains	Class II	Retain existing character of the landscape; levels of change to the characteristic landscape should be low
	Developed recreation areas around the reservoir (e.g., Horseshoe Bend) and water infrastructure of dam	Class III	Partially retain existing visual characteristics; the change to the characteristic landscape can be moderate
New Don Pedro[b]	New Don Pedro Reservoir and Highway 49 viewshed; the Sierra Nevada and aesthetics associated with foothills and mountains; developed recreation areas around the reservoir and water infrastructure of the dam	Class III	Partially retain existing visual characteristics; the change to the characteristic landscape can be moderate
New Melones[c]	New Melones Reservoir/Stanislaus River; the Sierra Nevada and aesthetics associated with foothills and mountains	Class II	Retain existing character of the landscape; levels of change to the characteristic landscape should be low
	Residential areas surrounding reservoir; the recreation areas of Tuttletown and Glory Hole; water infrastructure of the dam	Rural Developed	Views can experience modification
	Less developed recreation areas and opportunities; hiking trails	Rural Natural	Views should be partially retained
	Surrounding landscape of the Sierra Nevada	Semi-Primitive	Views should be preserved

Sources:
[a] BLM 2008; Merced ID 2011a; Merced ID 2010.
[b] BLM 2008; TID and MID 2013b.
[c] BLM 2008; USBR 2011a; USBR 2007.

Baseline conditions and LSJR Alternative 2–4 conditions are compared using the lowest one-third of reservoir elevations experienced over the 82-year simulation period for May–September. The lowest one-third is represented by the 30 percent cumulative distribution of reservoir elevations during this time period. This distribution provides a conservative method of evaluating the reservoir elevation data because it represents low elevation conditions typically experienced under drought or dry conditions.

To more fully evaluate the range of potential effects, reservoir recreational conditions are also assessed using the minimum reservoir elevations experienced over the 82-year simulation period for May–September. While the lowest elevations occur infrequently, they result in conditions that can be most detrimental to recreation. Because the alternatives may establish minimum carryover storage requirements, it is possible that the effect of the alternatives on minimum elevation levels may be different than the historical effect observed at the 30 percent cumulative distribution levels over the 82-year simulation period. An increase in the lowest reservoir elevations (i.e., the minimum values out of all 82 years) would represent an improvement in what would be the worst-case

conditions for reservoir access. Such an increase may compensate for any effects that might be associated with a decrease in reservoir elevations at the 30 percent cumulative distribution level.

Recreational opportunities and visual character and quality would be potentially restricted during these dry conditions because reduced reservoir elevations affect the usability of recreation facilities and the aesthetics of a reservoir. Recreational opportunities or visual character and quality could be significantly affected if there is a seasonal (May–September) average decrease in reservoir elevation greater than 10 ft, or a decrease below critical elevation levels for certain recreation activities (e.g., elevation levels associated with a boat launch), relative to baseline conditions. Quantifying the conditions in feet provide the actual reservoir elevation under baseline conditions compared to the conditions under the LSJR alternatives. A change of 10 or more feet is expected to result in a visible change to the reservoir elevations noticeable to recreationists. The reservoir elevations are already expected to be low because the evaluation is conducted using reservoir elevations at the 30 percent cumulative distribution level, which represents drier year conditions, as well as the minimum elevations, which represent the driest conditions. These conditions are expected to result in limitations of recreational facilities or visual quality that might not otherwise occur under average baseline conditions. Therefore, this chapter presents a conservative analysis of potential changes when compared to baseline.

Lake McClure

Lake McClure boat ramps cease operation at reservoir levels of 590–793 ft MSL. The ramp at Bagby is the first to close when the reservoir decreases to an elevation of 793 ft MSL, followed by Horseshoe Bend at 758 ft MSL, McClure Point at 650 ft MSL, southern Barrett Cove ramp at 630 ft MSL, and northern Barrett Cove and Piney Creek, both at 590 ft MSL (USBR 1999).

Table 10-8 presents the modeled reservoir elevations of Lake McClure for the LSJR alternatives during May–September. Modeled reservoir elevations under baseline conditions during May–September result in a seasonal change of approximately 81 ft for the 30 percent cumulative distribution and can support the use of most boat ramps. Similarly, the baseline minimum elevations would decrease by 55 ft over the May–September season and could support the use of some boat ramps, although fewer than at the 30 percent cumulative distribution level elevations (Table 10-8).

With the LSJR alternatives, elevations would stay well above 590 ft (the level at which all boat ramps are inoperable). Under LSJR Alternatives 3 and 4, seasonal average reservoir elevations would be greater than baseline by 11 and 9 ft, respectively, at the 30 percent cumulative distribution, and would be 23 ft relative to baseline elevations under LSJR Alternative 2. Seasonal average minimum elevations would be substantially higher than baseline by more than 80 ft under LSJR Alternatives 2 and 3, and by more than 40 ft under LSJR Alternative 4 (Table 10-9).

Table 10-8. Lake McClure May–September Minimum Elevations and Elevations at 30 Percent Cumulative Distribution (feet)

Month	Baseline Conditions	LSJR Alternative 2	LSJR Alternative 3	LSJR Alternative 4
Elevations at 30 Percent Cumulative Distribution				
May	782	794	776	760
June	775	789	777	766
July	748	769	759	759
August	720	751	741	745
September	701	741	730	742
Minimum Elevations (0 Percent Cumulative Distribution)				
May	546	680	667	660
June	587	686	671	649
July	612	685	683	638
August	615	682	681	618
September	601	673	673	599

Table 10-9. Changes in Lake McClure Minimum Elevations and Elevations at 30 Percent Cumulative Distribution Compared to Baseline (feet)

Month	LSJR Alternative 2	LSJR Alternative 3	LSJR Alternative 4
Change in Elevations at 30 Percent Cumulative Distribution			
May	12	-6	-21
June	14	2	-9
July	20	11	10
August	31	20	25
September	40	29	41
Seasonal Average	23	11	9
Minimum Elevations (0 Percent Cumulative Distribution)			
May	134	121	114
June	99	84	62
July	72	71	25
August	68	66	3
September	72	72	-2
Seasonal Average	89	83	41

New Don Pedro Reservoir

The maximum reservoir level for recreational use of New Don Pedro Reservoir is 830 ft MSL. Reservoir levels below 790 ft MSL generally result in lower recreational use (USBR 1999). At 780 ft MSL, beach use declines. Below 720 ft MSL some boat ramps become inoperable, reservoir surface area is limited, and campground and picnicking use declines (USBR 1999). At 630 ft MSL, the marina at Moccasin Point closes, and at 600 ft MSL, the boat launch and marina at Flemming Meadows become inoperable (USBR 1999).

Table 10-10 presents the modeled reservoir elevations at New Don Pedro Reservoir for the LSJR alternatives May–September for minimum elevations and at the 30 percent cumulative distribution. New Don Pedro Reservoir baseline elevations are below 780 ft MSL July–September at the 30 percent cumulative distribution and the minimum elevations are well below 780 ft for May–September. Reservoir elevations do not decrease to 630 ft under baseline (i.e., two marinas remain operational). Under baseline conditions, the seasonal May–September change in reservoir elevation is 51 ft for the 30 percent cumulative distribution and 42 ft for minimum elevations.

As presented in Table 10-11, implementation of LSJR Alternatives 3 and 4 would result in a decrease in the seasonal average reservoir elevations of more than 15 ft at the 30 percent cumulative distribution. Under LSJR Alternative 2, there would be a 3-foot decrease in the seasonal average reservoir elevation at the 30 percent cumulative distribution. However, reservoir elevation at the 30 percent cumulative distribution would not decrease below 720 ft (the level at which some boat ramps become inoperable and campgrounds and picnicking use begin to decline) for any of the alternatives. The seasonal average minimum elevation under LSJR Alternative 2 would be more than 15 ft higher than baseline. Under LSJR Alternatives 3 and 4, seasonal average minimum elevations would be 10 or more feet higher relative to baseline.

Table 10-10. New Don Pedro Reservoir May–September Minimum Elevations and Elevations at 30 Percent Cumulative Distribution (feet)

Month	Baseline Conditions	LSJR Alternative 2	LSJR Alternative 3	LSJR Alternative 4
Elevations at 30 Percent Cumulative Distribution				
May	795	792	767	759
June	787	783	760	753
July	770	765	749	747
August	753	749	741	739
September	744	742	734	736
Minimum Elevations (0 Percent Cumulative Distribution)				
May	700	711	702	706
June	683	701	692	693
July	674	688	679	686
August	663	679	679	681
September	658	676	677	680

Table 10-11. Changes in New Don Pedro Reservoir Minimum Elevations and Elevations at 30 Percent Cumulative Distribution Compared to Baseline (feet)

Month	LSJR Alternative 2	LSJR Alternative 3	LSJR Alternative 4
Change in Elevations at 30 Percent Cumulative Distribution			
May	-3	-28	-36
June	-3	-26	-33
July	-5	-21	-22
August	-4	-12	-14
September	-2	-10	-8
Seasonal Average	-3	-19	-23
Minimum Elevations (0 Percent Cumulative Distribution)			
May	11	3	6
June	18	9	10
July	14	5	12
August	16	16	18
September	18	19	23
Seasonal Average	16	10	14

New Melones Reservoir

On New Melones Reservoir, the optimal reservoir water level for recreation is 950–980 ft MSL (State Water Board 1999). Below 900 ft MSL, use of beaches declines. Below 880 ft MSL, the marina closes. At 860 ft MSL, the last official boat ramp (Glory Hole) becomes inoperable, reservoir surface area is limited, and campground and picnicking use declines. Below 850 ft MSL, all boat launches are inoperable (USBR 1999).

Table 10-12 shows modeled New Melones Reservoir elevations for the LSJR alternatives from May–September. New Melones Reservoir has experienced elevations below 950 ft (the lowest level for optimal recreation), resulting in baseline reductions to recreational opportunities. Under baseline conditions, the seasonal May–September change in reservoir elevation is 32 ft for the 30 percent cumulative distribution and 35 ft for the minimum elevations.

Hydrologic modeling of the LSJR alternatives predicts higher reservoir elevations than the predicted baseline seasonal elevations for the May–September period. Under baseline conditions, minimum reservoir elevations were below 850 ft MSL, the level at which boat launches become inoperable. In contrast, under all of the alternatives, minimum elevations would be above 850 ft.

As presented in Table 10-13, under LSJR Alternative 2, the seasonal average reservoir elevation would be 26 ft higher than baseline at the 30 percent cumulative distribution level. Seasonal average reservoir elevations for LSJR Alternatives 3 and 4 would increase 14 ft and 8 ft above baseline, respectively. Seasonal average minimum elevations would be higher than baseline by more than 120 ft under all LSJR alternatives.

Table 10-12. New Melones Reservoir May–September Minimum Elevations and Elevations at 30 Percent Cumulative Distribution (feet)

Month	Baseline Conditions	LSJR Alternative 2	LSJR Alternative 3	LSJR Alternative 4
Elevations at 30 Percent Cumulative Distribution				
May	944	966	953	938
June	941	967	952	942
July	929	957	944	937
August	917	945	934	934
September	913	938	930	932
Minimum Elevations (0 Percent Cumulative Distribution)				
May	770	883	890	880
June	758	880	887	877
July	747	877	884	873
August	738	874	881	870
September	735	874	881	870

Table 10-13. Changes in New Melones Reservoir Minimum Elevations and Elevations at 30 Percent Cumulative Distribution Compared to Baseline (feet)

Month	LSJR Alternative 2	LSJR Alternative 3	LSJR Alternative 4
Change in Elevations at 30 Percent Cumulative Distribution			
May	22	8	-6
June	27	11	2
July	27	15	8
August	27	17	17
September	25	17	19
Seasonal Average	26	14	8
Minimum Elevations (0 Percent Cumulative Distribution)			
May	113	120	110
June	123	129	119
July	130	137	126
August	136	143	132
September	139	146	135
Seasonal Average	128	135	124

Tulloch Reservoir

Water surface levels in Tulloch Reservoir are maintained through coordinated water releases from the New Melones Dam upstream and the Tulloch Dam downstream. Although the LSJR alternatives could alter the quantity of water flowing into Tulloch Reservoir, equivalent quantities of water would be released through Tulloch Dam. Therefore, while there would be different monthly flows through Tulloch Reservoir in LSJR Alternatives 2, 3, and 4, the surface elevations of the reservoir would not change.

Extended Plan Area

The analysis of the extended plan area generally identifies how the impacts may be similar to or different from the impacts in the plan area (i.e., downstream of the rim dams) depending on the similarity of the impact mechanism (e.g., changes in reservoir levels, reduced water diversions, and additional flow in the rivers) or location of potential impacts in the extended plan area. Where appropriate, the program of implementation is discussed to help contextualize the potential impacts in the extended plan area.

SDWQ Alternatives

As discussed in Chapter 5, *Surface Hydrology and Water Quality*, salinity levels in the southern Delta are expected to remain within their historical range (i.e., 0.2–1.2 deciSiemens per meter). Salinity levels in the southern Delta have a strong relationship with the salinity measured at Vernalis, and the SDWQ alternatives would not change historical water quality Vernalis. As part of these alternatives, reservoirs would continue to operate to meet the existing Vernalis EC[8] objective through the SDWQ program of implementation, thereby maintaining flows and water quality at Vernalis. As discussed in Appendix B, *State Water Board's Environmental Checklist*, changes in salinity do not result in changes to water-dependent or water-enhanced recreational opportunities in the southern Delta. Salinity fluctuations within the historical range are imperceptible to recreationists that use the southern Delta for water-dependent activities, such as boating or kayaking, and water-enhanced activities, such as wildlife viewing. As discussed in Chapter 7, *Aquatic Biological Resources*, salinity fluctuations within the historical range would not affect fish that inhabit the LSJR and southern Delta channels. Since salinity fluctuations fall within the historical range of salinity in the southern Delta, recreational fishing in the southern Delta would not be affected. Therefore, the SDWQ alternatives are not discussed further in this chapter with respect to recreational resources. To comply with specific water quality objectives or the program of implementation under SDWQ Alternatives 2 or 3, construction and operation of different facilities in the southern Delta could occur, which could involve impacts on recreational resources or aesthetics. These impacts are evaluated in Chapter 16, *Evaluation of Other Indirect and Additional Actions.*

As discussed in Appendix B, changes in salinity would not result in substantial changes to visual character or quality or aesthetics. The SDWQ alternatives are not applicable to the reservoirs and eastside tributaries. SDWQ alternatives are not discussed further in this chapter with respect to

[8] In this document, EC is *electrical conductivity*, which is generally expressed in deciSiemens per meter (dS/m). Measurement of EC is a widely accepted indirect method to determine the salinity of water, which is the concentration of dissolved salts (often expressed in parts per thousand or parts per million). EC and salinity are therefore used interchangeably in this document.

aesthetics. To comply with specific water quality objectives or the program of implementation under SDWQ Alternatives 2 or 3, construction and operation of different facilities in the southern Delta could occur, which could involve impacts on recreational resources or aesthetics. These impacts are evaluated in Chapter 16.

10.4.3 Impacts and Mitigation Measures

Impact REC-1: Substantially physically deteriorate existing recreational facilities on the rivers or at the reservoirs

No Project Alternative (LSJR/SDWQ Alternative 1)

The No Project Alternative would result in implementation of flow objectives identified in the 2006 Bay-Delta Plan. See Chapter 15, *No Project Alternative (LSJR Alternative 1 and SDWQ Alternative 1),* for the No Project Alternative impact discussion and Appendix D, *Evaluation of the No Project Alternative (LSJR Alternative 1 and SDWQ Alternative 1),* for the No Project Alternative technical analysis.

LSJR Alternatives

The LSJR alternatives may substantially physically deteriorate the condition of existing recreation facilities at reservoirs or on rivers. The condition of an existing recreational facility or feature is considered impaired if it is physically damaged or deteriorated in such a way that recreationists are unable to use it.

At recreational areas along the Stanislaus, Tuolumne, and Merced Rivers and the LSJR, an increase in the magnitude and frequency of high-flow conditions, such as conditions above 2,500 cfs or flood control releases, could damage existing on-bank recreation facilities (e.g., canoe/kayak put-ins, picnic areas, campgrounds, restrooms, and parking areas). Many recreational activities are limited to range of flows. A substantial increases in flows during the summer months could result in certain recreationists being unable to use the river for certain types of in-water activities.

Reductions in reservoir water elevations, as expected under the LSJR alternatives, could increase the distance between established facilities and the water, or reducing available reservoir area. Reservoir recreational use is known to decrease as receding water levels reduce water surface area, make boat ramps less accessible, and leave recreation facilities farther from shorelines (DWR 1994; USBR 1999).

LSJR Alternative 2 (Less than significant/Less than significant with adaptive implementation)

Rivers

Under LSJR Alternative 2, the frequency and magnitude of higher flows on the Stanislaus, Tuolumne, and Merced Rivers and the LSJR would be similar to baseline, exhibiting little fluctuation in July, August, and September. Modeled frequencies of flows greater than 2,500 cfs under LSJR Alternative 2 would generally decrease or stay the same on the three eastside tributaries (Tables 10-4, 10-5, and 10-6). These flows are not expected to result in more frequent inundation of on-bank recreation

facilities during the recreation season. Therefore, existing facilities are not expected be substantially deteriorated as a result of implementing LSJR Alternative 2.

The Tuolumne River and Merced River would generally experience fewer low flows (i.e., flows less than 500 cfs) in May and June and more mid-range flows (i.e., 500–1,500 cfs) optimal for boating and fishing during this time (Tables 10-4 and 10-5), although there would be an 11 percent decrease in flows between 500 and 1500 cfs relative to baseline in May on the Tuolumne River. On the Stanislaus River between May and June, there would be little change in flow compared to baseline conditions, with the exception of a 10 percent increase in mid-range flows in June (Table 10-6). The seasonal average frequency of flows within the ranges that support recreation would not decrease substantially (i.e., more than 10 percent) relative to baseline on any of the three eastside tributaries (Tables 10-4, 10-5 and 10-6). Therefore, in-water recreational conditions on these rivers are not expected to be substantially reduced under LSJR Alternative 2. The flows on the downstream end of the SJR at Vernalis are expected to increase in May and June, but generally remain the same July–September. These flows are generally too high for swimming or wading, but motorized boating or advanced kayaking or rafting could continue.

The historic hydrology of the three eastside rivers and the LSJR influences the types and conditions of recreational facilities and features, as well as the designated beneficial recreational uses, in and around these rivers. A change in the magnitude or duration of flows in rivers may somewhat alter the in-water recreational uses of the rivers under LSJR Alternative 2, as described above. While increased flows may lead to slightly fewer opportunities for swimming, these flows would likely lead to improved conditions for kayaking and whitewater rafting. Increased flows may also lead to more opportunities for on-bank recreational activities, such as wildlife viewing. In addition, increased flows are expected to improve conditions for fish (see Chapter 19, *Analyses of Benefits to Native Fish Populations from Increased Flow between February 1 and June 30*, for details regarding expected fish benefits). While it is unknown whether any increase in fish populations would be large enough to specifically and measurably enhance sport fishing opportunities on the rivers, some beneficial effects related to recreational fishing are anticipated. Accordingly, the rivers would continue to support the designated beneficial uses of recreation, as described in the Basin Plan (State Water Board 1998), and would not conflict with the support and continuation of recreational facilities and features as identified in local plans and policies.

Implementation of LSJR Alternative 2 would not substantially physically deteriorate existing recreation facilities on the Stanislaus, Tuolumne, and Merced Rivers and the LSJR. Therefore, use of these facilities would not decrease and impacts on recreational resources at these rivers would be less than significant.

Reservoirs

At Lake McClure, the simulated seasonal average elevation (May–September) under LSJR Alternative 2 would increase by 23 ft at the 30 percent cumulative distribution, and the seasonal average of the minimum elevations would increase substantially (89 ft [Tables 10-8 and 10-9]). At New Don Pedro Reservoir, there would be a small decrease (3 ft) in the seasonal average elevation at the 30 percent cumulative distribution and an increase of 16 ft for the minimum elevations (Tables 10-10 and 10-11). At New Melones Reservoir, substantial increases in elevation are expected for both the minimum elevations and elevations at the 30 percent cumulative distribution under LSJR Alternative 2 (Tables 10-12 and 10-13). These modeled reservoir elevations under LSJR Alternative 2 would generally maintain recreational facilities at the reservoirs (e.g., boat launches) and it is

expected that changes in reservoir elevations would not substantially affect the condition of existing recreation facilities. Accordingly, it is anticipated this alternative would not conflict with existing plans and policies supporting recreation and recreational facilities at the reservoirs. Therefore, impacts on recreational resources would be less than significant.

Adaptive Implementation

Based on best available scientific information indicating that a change in the percent of unimpaired flow is needed to reasonably protect fish and wildlife, adaptive implementation method 1 would allow an increase of up to 10 percent over the 20-percent February–June unimpaired flow requirement (to a maximum of 30 percent of unimpaired flow). A change to the percent of unimpaired flow would take place based on required evaluation of current scientific information and would need to be approved as described in Appendix K, *Revised Water Quality Control Plan.* Accordingly, the frequency and duration of any use of this adaptive implementation method cannot be determined at this time. However, an increase of up to 30 percent of unimpaired flow would potentially result in different effects as compared to 20-percent unimpaired flow, depending upon flow conditions and frequency of the adjustment. For example, an increase to 30 percent of unimpaired flow would result in a greater opportunities for in-water recreation at higher river flows, than at 20-percent unimpaired flow.

Based on best available scientific information indicating that a change in the timing or rate of unimpaired flow is needed to reasonably protect fish and wildlife, adaptive implementation method 2 would allow changing the timing of the release of the volume of water within the February–June time frame. While the total volume of water released February–June would be the same as LSJR Alternative 2 without adaptive implementation, the rate could vary from the actual (7-day running average) unimpaired flow rate. Method 2 would not authorize a reduction in flows required by other agencies or through other processes, which are incorporated in the modeling of baseline conditions. Method 3 would not be authorized under LSJR Alternative 2 since the unimpaired flow percentage would not exceed 30 percent.

Adaptive implementation method 4 would allow an adjustment of the Vernalis February–June flow requirement. The WSE model results show that under LSJR Alternative 2 the 1,200-cfs February–June base flow requirement at Vernalis would require a flow augmentation in the three eastside tributaries and LSJR only 2.7 percent of the time in the 82-year record analyzed. Similarly, flow augmentation would be required 0.7 percent of the time to meet a 1,000-cfs requirement and 0.5 percent of the time for an 800-cfs Vernalis base flow requirement. These results indicate that changes due to method 4 under this alternative would rarely alter the flows in the three eastside tributaries or the LSJR.

Impacts associated with adaptive implementation method 1 may be slightly different from those associated with methods 2 and 3. With method 1, if the specified percent of unimpaired flow were changed from 20 percent to 30 percent on a long-term basis, the conditions and impacts could become more similar to those described under LSJR Alternative 3 (e.g., 30 percent unimpaired flow). It is anticipated that over time the unimpaired flow requirement could increase or not change at all within a year or between years, depending on fish and wildlife conditions and hydrology. If method 2 is implemented, the total annual volume of water associated with LJSR Alternative 2 (i.e., 20 percent of the February–June unimpaired flow) would not change. It is unlikely that alteration of the timing of the river flows would result in substantial modification to the May through September flows or that alteration of the timing of the flows would produce large changes in monthly reservoir

storage values. Ultimately, the reservoirs would release the same total amount of water. On average, there would be little change in reservoir elevations. Further, given that this method would not allow flows to go below what is required by existing requirements on the three tributaries and the SJR, impacts would be similar to those described above for LSJR Alternative 2 without adaptive implementation. Implementing method 4 is expected to have little effect on conditions in the three eastside tributary rivers and LSJR because it rarely would cause a change in flow and the volume of water involved would be relatively small. Consequently, the impact determination for LSJR Alternative 2 with adaptive implementation would be the same as described above for LSJR Alternative 2 without adaptive implementation. Impacts would be less than significant.

LSJR Alternative 3 (Less than significant/Significant and unavoidable with adaptive implementation)

Rivers

Under LSJR Alternative 3, modeled frequencies of flows greater than 2,500 cfs would generally change little on the Merced and Stanislaus Rivers (Table 10-4 and 10-6). Thus, on-bank recreation facilities would not experience substantially more inundation compared to baseline conditions. Flows greater than 2,500 cfs would increase in frequency on the Tuolumne River in May and June, but would remain about the same relative to baseline July–September (Table 10-5). Although the flows on the Tuolumne River would likely result in an increase in the frequency of inundation of on-bank recreation areas during a few months in the recreation season, this inundation is not anticipated to substantially physically deteriorate the recreation facilities along the river. Recreation facilities are constructed in close proximity to rivers and are capable of withstanding periodic inundation by higher flows. Furthermore, higher flow events would not impact recreation areas at higher elevations. For example, the 250 acre Caswell Memorial Park contains some campsites that inundate at flows greater than 5,000 cfs. However, other campsites in the park remain available at high flows. Moreover, the existing capacity of similar facilities in the region would allow use to shift to facilities at higher elevations during these periods of high flow.

Lower flows would be less frequent on the three eastside tributaries in May and June under LSJR Alternative 3. On the Merced River, this would correspond to an increase in the frequency of 500-2,500 cfs flows, while on the Tuolumne and Stanislaus Rivers, flows greater than 1,500 cfs (including flows greater than 2,500 cfs) would be more common than under current and past conditions (Tables 10-4, 10-5 and 10-6). The modeled seasonal monthly average frequency of low flow conditions known to support swimming and wading would decrease nearly 20 percent on the Merced River and more than 10 percent on the Tuolumne River (Tables 10-4 and 10-5, respectively). However, on these two rivers, the frequency of low flows (less than 500 cfs) in July-September would experience little net change compared to baseline conditions (Tables 10-4 and 10-5). Therefore, during the warmest months in the San Joaquin Valley, when swimming and wading are typically the most popular, there would be little change relative to baseline conditions. As such, overall, the reduced condition for swimming and wading on the Merced and Tuolumne Rivers during May and June (i.e., early in the summer recreational season) is not expected to substantially reduce in-water recreation for the season.

The flows on the SJR at Vernalis are expected to increase in May and June, but generally remain the same July–September. These flows would generally remain too high for swimming or wading, but motorized boating or advanced kayaking or rafting may continue. Conditions for water-dependent recreation would be expected to be similar to past and present conditions.

The historic hydrology of the three eastside rivers and the LSJR influence the types and conditions of recreational facilities and features, as well as the designated beneficial recreational uses, in and around these rivers. A change in the magnitude or duration of flows in rivers may somewhat alter the in-water recreational uses of the rivers under LSJR Alternative 3, as described earlier. While increased flows may lead to slightly fewer opportunities for swimming, they would likely lead to improved conditions for kayaking and whitewater rafting. They may also lead to more opportunities for on-bank recreational activities such as wildlife viewing. In addition, increased flows are expected to improve conditions for fish (see Chapter 19, *Analyses of Benefits to Native Fish Populations from Increased Flow between February 1 and June 30,* for details regarding expected fish benefits). While it is unknown whether any increase in fish populations would be large enough to specifically and measurably enhance sport fishing opportunities within the rivers, some beneficial effects related to recreational fishing are anticipated. Accordingly, the rivers would continue to support the designated beneficial uses of recreation, as described in the Basin Plan, and would not conflict with the support and continuation of recreational facilities and features as identified local plans and policies.

Implementation of LSJR Alternative 3 would not substantially physically deteriorate existing recreation facilities on the Stanislaus, Tuolumne, and Merced Rivers and the LSJR. Therefore, use of these facilities would not be reduced, and impacts on recreational resources at these rivers would be less than significant.

Reservoirs

LSJR Alternative 3 would not significantly affect reservoir elevations at Lake McClure. Relative to baseline, seasonal average elevation would increase 11 ft at the 30 percent cumulative distribution, while seasonal average minimum elevation would increase 83 ft (Tables 10-8 and 10-9). Under LSJR Alternative 3, greater increases of both the minimum elevation (135 ft) and the elevation at the 30 percent cumulative distribution (14 ft) are expected at New Melones Reservoir (Tables 10-12 and 10-13). Accordingly, it is anticipated that this alternative would not conflict with existing plans and policies supporting recreation and recreational facilities at the reservoirs. Therefore, implementation of LSJR Alternative 3 would not substantially physically deteriorate, and thereby reduce the use of, existing recreation facilities at Lake McClure and New Melones Reservoir.

At New Don Pedro Reservoir, a substantial decrease in elevation is expected at the 30 percent cumulative distribution (seasonal average decrease of 19 ft). A 10-foot increase in seasonal average minimum elevations will dampen but not completely compensate for this decrease in seasonal average elevation (Tables 10-10 and 10-11). Reservoir elevation at the 30 percent cumulative distribution would not decrease below 720 ft (the level at which some boat ramps become inoperable and campgrounds and picnicking use begin to decline).Therefore all boat ramps are expected to remain operable under LSJR Alternative 3 at the 30 percent cumulative distribution elevation, with some boat ramps operable at minimum reservoir elevations. While lower elevations may somewhat impinge upon recreationists' access to boat ramps, the shoreline, or other recreational facilities, these change would not substantially physically deteriorate existing recreation facilities. Accordingly, it is anticipated this alternative would not conflict with existing plans and policies supporting recreation and recreational facilities at this reservoir. Implementation of LSJR Alternative 3 would not substantially physically deteriorate, and thereby reduce the use of, existing recreation facilities at New Don Pedro Reservoir.

Implementation of LSJR Alternative 3 would not substantially physically deteriorate or reduce the use of existing recreation facilities at Lake McClure, and New Melones and New Don Pedro Reservoirs. Accordingly, it is anticipated this alternative would not conflict with existing plans and policies supporting recreation and recreational facilities at these reservoirs. Therefore, this impact would be less than significant.

Adaptive Implementation

Under LSJR Alternative 3, impacts associated with adaptive implementation method 1 may be slightly different from those associated with adaptive implementation methods 2 and 3. Implementing method 1 would allow an increase or decrease of up to 10 percent in the February–June, 40-percent unimpaired flow requirement (with a minimum of 30 percent and maximum of 50 percent) to optimize implementation measures to meet the narrative objective, while considering other beneficial uses, provided that these other considerations do not reduce intended benefits to fish and wildlife. Adaptive implementation must be approved using the process described in Appendix K. Accordingly, the frequency and duration of any use of this adaptive implementation method cannot be determined at this time.

Adaptive implementation method 1 could affect the amount of water available for water supply and the volume of water and level of flow in the LSJR and its tributaries. However, an increase of up to 50 percent of unimpaired flow would potentially result in different effects as compared to the 40 percent unimpaired flow, depending upon flow conditions and the frequency of the adjustment. If the adjustment occurs frequently or for extended durations, impacts under LSJR Alternative 3 could become more like the impacts under LSJR Alternative 4. Model results indicate that if flow were increased from 40 percent of unimpaired flow to 50 percent of unimpaired flow, there would be substantial increases in the percent of time that May and June flows on the Tuolumne River would exceed 2,500 cfs (Tables 10-5 and 10-6). Accordingly, LSJR Alternative 3, with adaptive implementation method 1, would cause substantial deterioration of existing recreational facilities.

Under adaptive implementation methods 2 or 3, the overall volume of water from the February–June time period or after June would be the same as LSJR Alternative 3 without adaptive implementation, but the volume within each month could vary. It is unlikely that alteration of the timing of the river flows would result in substantial modification to the May through September flows or that alteration of the timing of the flows would produce large changes in monthly reservoir storage values. Ultimately, the same total amount of water would be released, so on average, there would be little change in reservoir elevations. Further, given that these two methods would not allow flows to go below what is required by existing requirements on the three tributaries and the SJR, impacts would be similar to those described above for LSJR Alternative 3 without adaptive implementation. Adaptive implementation method 4 would allow an adjustment of the Vernalis February–June minimum flow requirement. The WSE model results indicate changes due to method 4 under this alternative would rarely alter the flows in the three eastside tributaries or the LSJR, and thus would not affect recreation. Accordingly, LSJR Alternative 3, with adaptive implementation methods 2, 3, and 4, would not substantially affect recreational resources.

The historic hydrology of the three eastside rivers and the LSJR influence the types and conditions of recreational facilities and features, as well as the designated beneficial recreational uses, in and around these rivers. A change in the magnitude or duration of flows in rivers may somewhat alter the in-water recreational uses of the rivers under LSJR Alternative 3 with adaptive implementation method 1, as described earlier. Specifically, a shift to higher-flow recreational uses would be

expected with more frequent higher flows on the Stanislaus and Tuolumne Rivers. This may result in more opportunities for boating on the LSJR and fewer opportunities for swimming and wading; however, there are ample locations for swimming in the area, including in the Upper SJR and plan area reservoirs. Higher flows may also lead to more opportunities for on-bank recreational activities such as wildlife viewing or bird watching. In addition, increased flows are expected to improve conditions for fish (see Chapter 19, *Analyses of Benefits to Native Fish Populations from Increased Flow between February 1 and June 30,* for details regarding expected fish benefits). While it is unknown whether any increase in fish populations would be large enough to specifically and measurably enhance sport fishing opportunities within the rivers, some beneficial effects related to recreational fishing are anticipated. Accordingly, the rivers would continue to support the designated beneficial uses of recreation, as described in the Basin Plan (State Water Board 1998), and would not conflict with the support and continuation of recreational facilities and features as identified in local plans and policies. However, because the frequency of the higher flows is expected to substantially increase under LSJR Alternative 3, with adaptive implementation, it is likely that existing on-bank recreational facilities would be inundated more frequently and substantial physical deterioration would occur, thus reducing the use of the facilities. Therefore, impacts are significant.

An SED must identify feasible mitigation measures for each significant environmental impact identified in the SED. (Cal. Code Regs., tit. 23, § 3777, subd. (b)(3).) Reducing the occurrence of flows greater than 2,500 cfs, particularly in May and June on the Tuolumne River, could reduce this significant impact, but such a reduction would directly contradict the purpose of LSJR Alternative 3, with adaptive implementation, to potentially increase the flow, based on best available scientific information, for the beneficial use of wildlife and fish. This mitigation is, therefore, infeasible. Furthermore, evaluating the effects of lower flows on the different rivers is part of LSJR Alternative 2 and is separately considered in this document. Owners and operators of on-bank recreational facilities should operate and maintain the facilities to minimize physical deterioration from increased inundation, such as increased facility inspections and repairs. The State Water Board, however, lacks authority to require this mitigation measure. As such, LSJR Alternative 3, with the implementation of adaptive implementation method 1, would remain significant and unavoidable.

LSJR Alternative 4 (Significant and unavoidable/Significant and unavoidable with adaptive implementation)

Rivers

In May and June, modeled frequencies of flows greater than 2,500 cfs under LSJR Alternative 4 would substantially increase on the three eastside tributaries, particularly in the Tuolumne and Stanislaus Rivers (Tables 10-5 and 10-6, respectively). There would be little change in high flows from July–September (Tables 10-5 and 10-6). Although on-bank recreation facilities at all of these rivers are purposefully built adjacent to, and within close proximity of, rivers and are able to withstand periodic inundation by higher flows, the frequency of flows predicted under LSJR Alternative 4 would likely result in much more regular inundation of adjacent on-bank recreational facilities along the Tuolumne River than is currently experienced under baseline. This increase in frequency would likely contribute to substantial physical deterioration over time, thus resulting in a substantial reduction in use of the facilities. This could potentially result in increased use of other nearby facilities by recreationists or a shift to water-enhanced activities (such as hiking). Therefore, impacts would be significant.

Lower flows would be less frequent on the three eastside tributaries in May and June under LSJR Alternative 4. On the Merced River, the modeled seasonal average frequency of flows less than 500 cfs would decrease by 26 percent relative to baseline, and there would be a 13 percent and 9 percent decrease on the Tuolumne River and Stanislaus River, respectively. Thus, the frequency of flows for lower flow recreational uses such as swimming, particularly in May and June, would substantially decrease (Tables 10-4 and 10-5). As a result of the increases in flow, the Merced River may experience increases in all recreational flow categories other than those for swimming and floating, and the Tuolumne River may provide more opportunity for advanced kayaking recreationists. Because there would be little change in high flows on the Merced River July–September, and on the Tuolumne River August and September, the warmest months in the San Joaquin Valley, when swimming and wading are typically the most popular, there would be little change relative to baseline conditions. As such, overall, the reduced opportunity for swimming and wading on the Merced and Tuolumne Rivers during May, and particularly during June (i.e., early in the summer recreational season), is not expected to substantially change in-water recreation conditions for the season. Low-flow water-dependent recreational conditions conducive to swimming in the Stanislaus River would be most affected during June, but the seasonal average frequency of flows supporting various recreation types are not expected to decrease more than 10 percent through the summer recreation season (Table 10-6).

Flows on the LSJR would remain generally too high for in-water recreational activities other than motorized boating and advanced rafting or kayaking at Vernalis in the northern extent of the plan area. While there is little known use of the southern portion of the LSJR for swimming, conditions for water-dependent recreation would be expected to be similar to past and present conditions.

The historic hydrology of the three eastside rivers and the LSJR influence the types and conditions of recreational facilities and features, as well as the designated beneficial recreational uses, in and around these rivers. A change in the magnitude or duration of flows in rivers may somewhat alter the in-water recreational uses of the rivers under LSJR Alternative 4, as described above. Specifically, a shift to higher-flow recreational uses would be expected with more frequent higher flows on the Merced and Tuolumne Rivers in May and June flow into the LSJR. This may result in more opportunities for boating on the LSJR and fewer opportunities for swimming and wading; however, there are ample locations for swimming in the area, including in the Upper SJR and at the plan area reservoirs. Higher flows may also lead to more opportunities for on-bank recreational activities such as wildlife viewing or bird watching. In addition, increased flows are expected to improve conditions for fish (see Chapter 19, *Analyses of Benefits to Native Fish Populations from Increased Flow between February 1 and June 30,* for details regarding expected fish benefits). While it is unknown whether any increase in fish populations would be large enough to specifically and measurably enhance sport fishing opportunities within the rivers, some beneficial effects related to recreational fishing are anticipated. Accordingly, the rivers would continue to support the designated beneficial uses of recreation, as described in the Basin Plan (State Water Board 1998), and would not conflict with the support and continuation of recreational facilities and features as identified local plans and policies.

However, because the frequency of the higher flows is expected to substantially increase under LSJR Alternative 4, it is likely that existing on-bank recreational facilities would be inundated more frequently, and substantial physical deterioration would result, thus reducing the use of the facilities. Therefore, impacts are significant.

An SED must identify feasible mitigation measures for each significant environmental impact identified in the SED. (Cal. Code Regs., tit. 23, § 3777, subd. (b)(3).) Reducing the occurrence of flows greater than 2,500 cfs, particularly in May and June on the Stanislaus and Tuolumne Rivers could reduce this significant impact, but such a reduction would directly contradict the purpose of LSJR Alternative 4. Furthermore, evaluating the effects of lower flows on the different rivers is part of the other alternatives and is separately considered in this document. Requiring less flow, beyond that prescribed by adaptive implementation method 1 further described below, cannot be independently applied under LSJR Alternative 4 as a mitigation measure because requiring flow reductions would be inconsistent with the terms of LSJR Alternative 4, with or without adaptive implementation, and is, therefore, infeasible. Owners and operators of on-bank recreational facilities should operate and maintain the facilities to minimize physical deterioration from increased inundation, such as increased inspections and repairs. The State Water Board, however, lacks authority to require this mitigation measure. As such, impacts under SJR Alternative 4 would remain significant and unavoidable.

Reservoirs

LSJR Alternative 4 seasonal average reservoir elevations at Lake McClure would increase by 9 ft at the 30 percent cumulative distribution and would increase by 41 ft at minimum (Tables 10-8 and 10-9). At New Melones Reservoir, substantial increases in seasonal average minimum elevations (124 ft) are expected and seasonal average elevations at the 30 percent cumulative distribution (8 ft) would be minimally affected under LSJR Alternative 4 (Tables 10-12 and 10-13). Therefore, implementation of LSJR Alternative 4 would not substantially physically deteriorate nor reduce the use existing recreation facilities at these reservoirs.

At New Don Pedro Reservoir, a substantial decrease in elevation is expected at the 30 percent cumulative distribution (seasonal average decrease of 23 ft), which would be somewhat, but not entirely, compensated for by increases in the minimum elevations (seasonal average increase of 14 ft) (Tables 10-10 and 10-11). It is expected that these changes would not substantially physically deteriorate existing recreation facilities. At the 30 percent cumulative distribution, all boat ramps would remain operational under LSJR Alternative 4 at New Don Pedro Reservoir. Minimum elevations at New Don Pedro Reservoir were below 726 ft for both baseline and LSJR Alternative 4, but were generally higher for LSJR Alternative 4 than for baseline. LSJR Alternative 4 would not render existing recreation facilities inoperable and, therefore, would not results in physical deterioration of the existing facilities.

Implementation of LSJR Alternative 4 would not substantially physically deteriorate the existing recreation facilities at Lake McClure, and New Melones and New Don Pedro Reservoirs. Therefore, use of these facilities would not be reduced, and this impact would be less than significant.

Adaptive Implementation

As discussed under LSJR Alternative 2, adaptive implementation methods 2 and 4 are not expected to result in impacts on recreational resources. As discussed under LSJR Alternative 3, adaptive implementation method 3 would result in similar impacts to those described above. Adaptive implementation method 1 would allow a decrease of up to 10 percent in the February–June, 60-percent unimpaired flow requirement (to 50 percent) to optimize implementation measures to meet the narrative objective, while considering other beneficial uses, provided that these other considerations do not reduce intended benefits to fish and wildlife. Adaptive implementation must

be approved using the process described in Appendix K. Accordingly, the frequency and duration of any use of this adaptive implementation method cannot be determined at this time. If the specified percent of unimpaired flow were changed from 60 percent to 50 percent on a long-term basis, the conditions and impacts could become more similar to LSJR Alternative 3, with adaptive implementation. The modeling results show that if the adjustment occurs frequently or for extended durations, impacts would be significant and are no different than those presented for LSJR Alternative 4.

Impact REC-2: Substantially degrade the existing visual character or quality of the reservoirs

No Project Alternative (LSJR/SDWQ Alternative 1)

The No Project Alternative would result in implementation of flow objectives identified in the 2006 Bay-Delta Plan. See Chapter 15, *No Project Alternative (LSJR Alternative 1 and SDWQ Alternative 1),* for the No Project Alternative impact discussion and Appendix D, *Evaluation of the No Project Alternative (LSJR Alternative 1 and SDWQ Alternative 1),* for the No Project Alternative technical analysis.

LSJR Alternatives

Low water levels at reservoirs can expose a less visually pleasing shoreline to recreationists that is devoid of vegetation due to fluctuating water elevations (DWR 1994; USBR 1999). As summarized in Table 10-7 in Section 10.4.2, *Methods and Approach*, views at the Lake McClure and New Don Pedro and New Melones Reservoirs are classified to indicate if modification of the views or visual character and quality of each reservoir are acceptable or if retention of views is recommended. The views of Lake McClure and New Melones Reservoir are classified as Class II, indicating that views and retention of the existing character of the landscape is recommended. The views of Don Pedro Reservoir are classified as Class III, indicating that views and changes to the character of the landscape can be moderate.

LSJR Alternative 2 (Less than significant/Less than significant with adaptive implementation)

The change in the three reservoir elevations would not result in a substantial change to the existing visual character of the reservoirs. The changes in reservoir elevations at Lake McClure and New Melones Reservoir could result in an improvement to the existing views as reservoir elevations are expected to increase under certain conditions. As described under Impact REC-1, there would be a minimal decrease in reservoir elevations at New Don Pedro Reservoir at the 30 percent cumulative distribution relative to baseline; however, it is not anticipated this 3-foot seasonal average decrease would result in a substantial degradation of the visual character of the reservoir. Adaptive implementation is not anticipated to substantially change this effect. Therefore, viewers would continue to experience the water–land interface and would continue to see water from viewpoints, and this visual experience would not conflict with existing plans or policies meant to support or maintain existing views. Impacts would be less than significant.

LSJR Alternative 3 (Less than significant/Less than significant with adaptive implementation)

Reservoir elevations are expected to change as described above for Impact REC-1. The changes in elevations at Lake McClure and New Melones Reservoir could result in an improvement to the existing views as reservoir elevations are expected to increase under certain conditions. This visual experience would not conflict with existing plans or policies meant to support or maintain existing views. Adaptive implementation is not anticipated to substantially change these effects. Therefore, impacts would be less than significant.

As described under Impact REC-1, there would be a substantial decrease in reservoir elevations at New Don Pedro Reservoir at the 30 percent cumulative distribution relative to baseline. However, it is not anticipated this decrease would result in a substantial degradation of the visual character of the reservoir. This is because the views of Don Pedro Reservoir are classified as Class III views. These views are considered lower quality under existing conditions and can, therefore, be more readily modified as a result of the Class III designation. Reservoir elevation fluctuations are typical of this environment. Furthermore, viewers would still experience the reservoir, the existing fluctuation of elevation, and lack of vegetation within the fluctuation zone, all within the context of the foothills and mountains. Finally, although the water elevations would change, recreationists would continue to experience the water–land interface. This visual experience would not conflict with existing plans or policies meant to support or maintain existing views. Adaptive implementation is not anticipated to substantially change these effects. Therefore, impacts would be less than significant.

LSJR Alternative 4 (Less than significant/Less than significant with adaptive implementation)

Reservoir elevations are expected to change as described above for Impact REC-1. The changes in elevations at Lake McClure and New Melones Reservoir could result in an improvement to the existing views as a reservoir elevations are expected to increase under certain conditions. This visual experience would not conflict with existing plans or policies meant to support or maintain existing views. Adaptive implementation is not anticipated to substantially change these effects. Therefore, impacts would be less than significant.

As described under Impact REC-1 for LSJR Alternative 4 there would be a substantial decrease in reservoir elevations at New Don Pedro Reservoir at the 30 percent cumulative distribution relative to baseline; however, it is not anticipated this decrease would result in a substantial degradation of the visual character of the reservoir because of the Class III designation of views at this reservoir, the typical fluctuations of reservoirs, and the land–water interface experience of recreationists. This visual experience would not conflict with existing plans or policies meant to support or maintain existing views. Adaptive implementation is not anticipated to substantially change these effects. Therefore, impacts would be less than significant.

10.4.4 Impacts and Mitigation Measures: Extended Plan Area

Bypassing flows in the extended plan area, as described in Chapter 5, *Surface Hydrology and Water Quality*, could potentially impact recreational resources and the visual character and quality of upstream reservoirs on the Stanislaus and Tuolumne Rivers differently in the extended plan area than described in the plan area. Particularly, existing scenic vistas and scenic highways could be

affected. These impacts could occur if reservoirs experienced substantial changes in reservoir volume, especially under drought conditions, particularly under LSJR Alternatives 3 and 4 with or without adaptive implementation, which are not experienced by the rim reservoirs. However, under baseline conditions these reservoirs undergo substantial annual water level and volume fluctuations as water is released from the reservoirs for hydropower production, consumptive use, and instream flow requirements (USGS Reservoir Gage Data). Under baseline conditions, these fluctuating reservoir volumes impact recreation at individual reservoirs by reducing the lake area available for boating or fishing, potentially isolating boat ramps and thereby limiting boat access to the reservoir, and potentially isolating swimming beaches from the reservoir. For example, this type of reduction has occurred during the recent drought (UGSG Reservoir Gage Data). However, these volume reductions could occur more frequently, and could be more pronounced during drought conditions, particularly under LSJR Alternative 3 and LSJR Alternative 4 with or without adaptive implementation, but also under LSJR Alternative 2 with adaptive implementation. Consequently, there could be significant recreation impacts at reservoirs under the LSJR Alternative 2 with adaptive implementation and LSJR Alternatives 3 and 4 with or without adaptive implementation, in the extended plan area, as explained below.

The aesthetic quality of these reservoirs would be affected when the reservoir levels are drawn down enough the unvegetated rim around their perimeter is visible. Exposure of the unvegetated rim occurs during normal operations; however, as noted above, exposure could occur more frequently under drought conditions, particularly under LSJR Alternatives 3 and 4 with or without adaptive implementation, but also under LSJR Alternative 2 with adaptive implementation. Consequently, there could be significant aesthetic impacts at reservoirs in the extended plan area, as explained below.

There is some potential that drawdown in upstream reservoir storage could result in reduced flows in the fall on the Stanislaus and Tuolumne Rivers. Flow reductions could have a substantial adverse effect on scenic views along the Stanislaus and Tuolumne Rivers if flows are reduced such that viewers (e.g., recreationists) cannot see water in the river and the river becomes less of a feature defining the overall landscape. Flow reductions could substantially degrade the visual character and quality of views of the Tuolumne River, many parts of which are designated as wild and scenic (total 83 miles) (National Wild and Scenic River System 2016). The degradation of views could damage a scenic resource (the river itself) as seen from eligible state scenic highways adjacent to the river (e.g., Highway 49). While no sections of the Stanislaus River are designated as wild and scenic, flow reductions could substantially degrade the visual character and quality of the views of the Stanislaus River, which can be viewed from designated State Scenic Highways 108 and 4 (National Wild and Scenic River System 2016; Caltrans 2016; DOT 2016). Impacts would could be significant, even though higher spring flows and lower fall flows are reflective of what would occur in a natural system. Providing more flows in the fall could mitigate this impact; however, it is counter to each alternative's purpose to provide additional flows during February to June to more closely mimic the natural hydrograph for the protection of fish and wildlife beneficial uses, and is therefore infeasible. There are no other feasible mitigation measures that the State Water Board may impose. Impacts would remain significant and unavoidable.

Many sections of the Merced River are designated wild and scenic (total 122 miles) or within view of designated state scenic highways (Highways 140 and 120) (National Wild and Scenic River System 2016; Caltrans 2016; DOT 2016); however, given the lack of substantial upstream reservoirs, it is unlikely that flow reductions would occur on the Merced River. Therefore, the visual character and quality of the Merced River would not be affected.

Rivers flows on the Stanislaus and Tuolumne Rivers could potentially impact recreational resources in the extended plan area on the Stanislaus and Tuolumne Rivers similar to the impacts described in the plan area. Under LSJR Alternatives 3 and 4 with or without adaptive implementation, the rivers may have higher and more frequent flows when compared to baseline conditions during the bypass period. The higher flows could occur when junior water is bypassed during the snow melt season. As such, on-bank recreational facilities along the three rivers could be inundated more frequently, which could result in the deterioration of facilities. Impacts could be significant. Reducing flows could reduce this impact; however, such a reduction would directly contradict the purpose of these alternatives and is, therefore, infeasible. Owners and operators of on-bank facilities should operate and maintain facilities to minimize the physical deterioration from the increased frequency of inundation, such as increased inspections and repairs; however, the State Water Board lacks authority to impose this mitigation measure, and the impact remains significant. In addition, the combination of snowmelt and possible increases in bypass flows under LSJR Alternatives 3 and 4 with or without adaptive implementation may result in flows that are too high to support in-water recreational uses (e.g., swimming, rafting, kayaking). However, these high flow impacts are expected to be of short duration as the snow pack progressively melts and the related snow-melt flow declines. These impacts are also similar to those that occur under baseline conditions. Conversely, after the bypass period the rivers may have lower flows compared to baseline conditions under LSJR Alternatives 3 and 4 with or without adaptive implementation if reservoir volumes are then low due to the bypassed flow. This could affect in-river recreational uses on the Stanislaus and Tuolumne Rivers.

The increased frequency of lower reservoir levels resulting from the LSJR alternatives and the associated physical changes to recreation and aesthetics would be limited by the program of implementation under each of the LSJR alternatives. The program of implementation requires minimum reservoir carryover storage targets or other requirements to help ensure that providing flows to meet the flow objectives will not have adverse or other impacts on fish and wildlife or, if feasible, on other beneficial uses (i.e., recreation). Other requirements, for example, include, but are not limited to, limits on required bypass flows for reservoirs that store water only for non-consumptive use so that some water can be temporarily stored upstream. The program of implementation also states that the State Water Board will take actions as necessary to ensure that implementation of the flow objectives does not impact supplies of water for minimum health and safety needs, particularly during drought periods. Accordingly, when the State Water Board implements the flow objectives in a water right proceeding, it will consider impacts on fish, wildlife, and, if feasible, on other beneficial uses, and health and safety needs, along with water right priority. Until the State Water Board assigns responsibility to meet the flow objectives in the Bay-Delta Plan, it is speculative to identify the exact extent, scope, and frequency of reduced diversions, reduced reservoir levels and their effects on recreation and aesthetics within the extended plan area. When implementing the flow objectives, the State Water Board would identify project-specific impacts and avoid or mitigate, to the extent feasible, significant impacts of lower reservoir levels on recreation and aesthetics in accordance with CEQA.

At the time of preparation of this programmatic analysis, it is unclear to what extent any significant impacts on recreation and aesthetics could be fully mitigated. Thus, the potential exists for significant impacts. Therefore, this analysis conservatively concludes that impacts associated with lower reservoir levels under LSJR Alternative 2 with adaptive implementation, and LSJR Alternatives 3 and 4 with or without adaptive implementation are significant. The following mitigation measure is proposed: when considering carryover storage and other requirements to

implement the flow water quality objectives in a water right proceeding, the State Water Board shall ensure that reservoir levels upstream of the rim dams do not cause significant recreation and aesthetic impacts, unless doing so would be inconsistent with applicable laws. Even with mitigation, the impact is considered significant, because the mitigation may not fully mitigate the impact in all situations.

10.5 Cumulative Impacts

For the cumulative impact analysis, refer to Chapter 17, *Cumulative Impacts, Growth-Inducing Effects, and Irreversible Commitment of Resources.*

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